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MEDICAL EXPERT TESTIMONY.*

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My feelings upon receiving the invitation to address your society were the mingled ones of desire and reluctance: desire to evidence my appreciation of the compliment which the invitation implied, and reluctance to address so distinguished and learned an assembly on a subject upon which I was so little capacitated to enlighten. It was not until I had read—and reread—the thoughtful and learned article of your eminent chairman, suggesting legal remedies for the abuses occurring under the present system of administration of medical expert testimony, that it occurred to me that I might possibly throw some feeble light upon the discussion by presenting to you this subject from the viewpoint of the lawyer, rather than from that to which you have been accustomed—that of the scientist.

These two attitudes cannot, from the nature of things, ever exactly coincide. The devotee to medical science, like his brother in other fields of scientific learning and exploration, is concerned only with his consciousness of the correctness of his conclusion. He deals in abstract reasoning. Close analysis, accurate observation and logical conclusion are for him the beginning and the end of each problem. If he be intelligently careful in his observation of facts, able to discard the wrong and accept the correct principles to be applied, and capable of applying these principles to his ascertained facts by proper process of reasoning, he is and should be satisfied with his conclusion.

But the lawyer's viewpoint cannot be restricted to the abstract correctness of any proposition. He deals with that most uncertain of all qualities—human nature. His function is, not merely to arrive at right, but to convert right into justice through the chemical agency of human action. In his contact with courts he must endeavor to bring the mind of the judge into harmony with his own, so that the mental processes of the authority to whom constituted government has committed the function of decision shall accept his theory of fact and the conclusion thereon based. In dealing with the jury he has still further complications to mar the scientific tendency of his professional work—the untrained and undisciplined mind, and the ignorance, the prejudice and the maudlin sentimentality with which our juries are so often marked. And yet, because our Constitutions so require and, to be fair, because no better system has yet been devised to administer criminal justice as the community desires it administered (which after all is the real reason, though one is supposed never to say it aloud, for its retention), we must continue to deal with the jury as a permanent institution, though perhaps with the same feeling as does the small boy for whom you prescribe the time honored castor oil.

*Read before Louisiana State Medical Society, Baton Rouge, April 10-12, 1928.

The point is that you scientists deal with the abstract; we of the law with the concrete, and that upon the basis of human conduct, thought and emotion, the most inconstant of all variables.

But, however in practice our two professions may require different angles of approach, they are in absolute accord and unison upon their search for truth. And no difference may or can exist between the standards of ethics and of right between the medical and legal professions; in both they must be grounded upon and incorporated with the earnest and whole-hearted search of truth and pursuit of right.

I have taken a long time to arrive at my text, but my answer to the problems involved in the subject assigned to me flows entirely from what I have just said.

The topic is not a new one; but never has the subject been more often or livelier discussed in press and in periodicals than now, nor ever have remedies been as profusely and as earnestly insisted upon for what is acclaimed a crying evil, and even a disgrace. And yet everywhere these critics, these howlers for reform, fail to perceive that the blind spot in their mental vision is their inability or failure to see that the evils are not of the essence, are not inherent in the present system, but result from the human equation, which must likewise influence and control any system to be carried out by human beings.

In brief, as I see it, the argument is a two-fold one:

1. That the present system of adducing medical expert testimony is wrong.

2. That there should be laws to remedy it.

But members of your profession ought to be slow to favor the making of laws for its regulation. Even for admitted evils, the remedy is more than apt to be worse than the disease. Evidence the legislative impudence in dictating to learned physicians what they may or may not prescribe for their patients, regardless of the effect of these inhibitions on health or life itself. Witness the demoralizing influence on a temperate people of the ridiculous law which attempts to wipe out a world-old and normal human appetite. Consider that other law which, to eliminate an evil traffic, says to the physician and the surgeon: "You may not secure that drug which alone may relieve your patient's suffering or cure his disease." I should think your profession would be loath to increase the scope of legislative control or to limit your own sphere of usefulness by the constricting power of legislation. Such action should be unthinkable, unless there be an admitted evil which requires the drastic remedy of lawmaking to abolish.

The greatest defect in the present system of adducing expert testimony is that your expert tends to become an advocate; that he may be employed because his opinion happens to coincide with that which is necessary to his employer's case, or, as sometimes happens, that he has worked up an opinion to fit that case. In either event, he is produced as a witness with the sole object in view of making out a case; and he appears, as truly as does the counsel, to advocate a particular conclusion and to bring to bear every mental resource to compel a decision favorable to the cause he represents for pay.

But, despite the frequency with which we encounter this combination of advocate and paid witness, it would be a gross slander on a noble profession to say that it was the rule. Just as the law has its shysters and crooks, so has medicine its quacks and frauds, and the ministry its blacklegs and hypocrites. But no sane man would contend that these unworthy practitioners illustrate the thought or conduct of the profession or that they constitute, however distinguished they may be, other than the element of which each profession must clean itself if it hope to retain public esteem. It cannot leave that

prophylaxis to the law; it must save itself. That both our professions can stand purgation I have no doubt, but we must administer the drug ourselves.

The reason secondarily advanced is the frequency with which medical expert witnesses clash with each other in their conclusions, the confusion which a jargon of scientific terms produces in judge and jury, and the alleged necessity of allaying this dizziness by resort to other experts connected with no parties to the case. But it must not be forgotten that the honest expert is in the real sense a witness. The resolving of conflicts of testimony is an essential province of the court. Almost every case depends upon the determination of issues of fact, which means the reconciliation of apparently conflicting testimony or the rejection of some and the acceptance of other evidence. A surprisingly small percentage of litigated cases depend upon controverted propositions of law; in general the law is easy to apply when once the court can clearly determine the essential facts. The most honest of witnesses may and often do differ materially in their testimony as to facts occurring under their immediate observation. Why, then, should it be held a mark of opprobrium that scientists should differ in their opinions? In such cases, the court or jury have the same identical problem that they constantly have before them—the problem of decision by the weighing of opposing or apparently conflicting testimony. That, in its very essence, is a judicial function, which cannot be delegated to any body of experts, however learned they may be.

There is already in Louisiana sufficient law effectually to remedy in any case any abuse that might be threatened, either from the partisan character of expert testimony or from conflicting opinions of equally eminent jurists. The Code of Practice and the jurisprudence of the Supreme Court afford ample authority and precedent for the judge in any case to appoint experts, and he has entire freedom of action in his selection. But such appointed experts are subject to examination and cross-examination, just as are those summoned or employed by the interested parties. Such judicial appointee, therefore, is removed from those factors which would induce partisan bias, but he appears not as judge or umpire, and is as subject to a testing of the correctness of his conclusions as is any other witness.

In this lies the necessary safeguard to the right of the individual. For, in the quest for betterment of social conditions, it must never be forgotten that individual liberty is the sole reason and excuse for organized government; that indeed the liberty of the individual constitutes, in its final analysis, the only true freedom. One's right to claim or to retain that which belongs to him, his right to resort to legal process to vindicate such rights, his right to defend his honor, his reputation, his liberty, his life by all means constituting due process of law, are guaranteed—not given—to him by the organic law. These rights, says the Constitution, are reserved to the people; mark the word "reserved," not "granted." They belong to and are inherent in any free people, and are never surrendered except to despotic power. One is entitled, of right, to summons in his behalf the witnesses to vindicate his rights, whether assailed by a private litigant or by the state itself. That right should not be and cannot be denied him. He is entitled to have submitted to the branch of government to which has been confided the power of adjudicating rights of life, liberty and property the evidence of his witnesses. He cannot be deprived of either —of life, liberty or property—upon the opinion of any expert body which is not tested by the appearance in court of its members in his presence and by their cross-examination, and which is not submitted, as is other evidence, to court and jury to be weighed and passed upon.

Legislation along lines which would prohibit the free selection by litigants or ac-

cused of their own expert witnesses, or which would resolve expert conflicts by resort to a body of selected experts, must be dismissed as impossible under our bill of rights and our scheme of liberty.

Please do not misunderstand me. I do not say that there is not much of truth in the charges leveled in general on the testimony of paid experts. Every legal practitioner has witnessed dishonest and suborned medical expert testimony. But he has seen dishonest lawyers; he has seen ignorant, prejudiced and corrupt jurors; and he has seen judges unfit for the judicial role. But particular instances do not suffice for general indictment, nor do evils in administration of rights justify abolition of the rights themselves.

May I suggest that the only practical remedy lies, not with the law, but with the human equation. As long as we have dishonest lawyers, dishonest experts will be found. As long as the so-called better classes systematically evade jury duty and leave its performance in such large part to the unfit, we shall have the disgraceful court performances intended to becloud the already clouded mind. As long as the educated and otherwise intelligent classes leave the selection of judges to the professional politician, we shall have the occasional ignoramus, crook or poltroon who sometimes disgraces the court room. If there were the real and abiding popular interest in the administration of justice that should be inherent in a people who have inherited the traditions of America, the judicial branch of the government, in which finally our liberties repose, would be administered by those who would meet the powers and responsibilities of their high honors and who would sternly repress those performances which have brought so much of reproach on both our professions.

Meanwhile, the only remedy as I see it, is that of house-cleaning. Vigorous effort to rid law and medicine of their unworthy members alone can give sanction to their ethics. The lawyer who makes himself a party to a line of conduct based upon fraudulent expert testimony should be dealt with just as if he had committed the statutory offense of subornation of perjury. The doctor who forgets or lays aside his professional honor and prostitutes himself should be summarily dealt with by you.

I cannot but feel that the only effective remedy for the abuses that have brought such discredit upon the noble function of enlightening legal tribunals on matters of medical science lies in the disciplinary powers inherent in such associations as yours and in the effect of such exercise upon public opinion.

DISCUSSION.

Dr. G. M. G. Stafford (Alexandria): I am painfully conscious of the fact that I am very inadequately qualified to discuss a paper of this kind, however, I think that the Honorable S. L. Herold's splendid paper is the most timely one which has been presented to this body in many a day.

The present status of expert testimony is, to me, a most deplorable one. It accomplishes little toward meeting the intentions of the law, and it is frequently a source of deep embarassment to the better thinking element of the medical profession. It is frequently repugnant to us to read the press headlines commenting on the divergence of opinions expressed in life and death cases by experts on opposing sides.

Now, expert testimony means testimony given by men who are qualified to speak with the voice of authority. As it is today, it means testimony given by one whom the courts see fit to qualify as an expert. I think that is all wrong. We have all seen the spectacle of a man testifying in a capital offense case, who is not even familiar with the rudiments of the subject, yet, he is qualified as an expert and speaks with authority.

Not many years ago, in a parish in central Louisiana, I will never forget it, I saw three physicians qualified as experts in a murder case, where the individual pleaded insanity. Those gentlemen had never seen, to my knowledge, an institution where insanity is treated, they knew very little about it, and, yet, they testified on the subject emphatically as to the sanity of that man, and he was hanged as a result of it. Now, I have no doubt, from my knowledge of the case, that the man was guilty, but his life depended solely on expert testimony, and I do not think he got a square deal. I think there should be a definite standard for the qualifi-

cations as an expert, and it should be adopted by legislative act and drawn up by a committee from both the medical and legal profession.

I think Judge Herold brought out a point that impressed me, he said the expert of today is too prone to become an advocate. I do not care how honest a man is, or how well he testifies, he is going to lean to the side by which he is employed. It is nothing but human, he tells the truth, but he tells it in a way that he helps his side. He cannot help it, he does it unconsciously.

The Massachusetts law, even though it is not perfect, seems to me is a step in the right direction. Now, under its provisions all persons indicted with a capital offense must undergo a mental examination before the trial, and this examination is conducted by the State Department of Mental Diseases. Their report is filed with the clerk of the court, and is to be used in the trial. Now, this is an intelligent, unbiased, competent agency which passes on this man's case. That law not only applies to capital offenses, but to all felonies which have been committed more than once, where the man repeats the crime. Those cases must go before this commission before anything else is done.

Now, it seems to me that such a department in every state is not only essential, but would prove a great safeguard to society, in discovering latent and developing mental disorders, which sooner or later would result in some shocking crime. It is too late to close the door after the horse is out. You ought to do this beforehand.

Now, our present method of attempting to pass on the sanity of a case by an ordinary routine examination of an hour or two is entirely inadequate. If such a person were sen to a hospital where insanity is treated, and placed there under observation, a definite, correct diagnosis could sooner or later be made.

A man can feign insanity for a short time, he cannot feign it all the time. If he is there under observation he is going to give himself away sooner or later, if he isn't crazy, but he can fool you for a while if he is smart enough.

I have noticed in some cases that sanity or insanity is determined by the jury. I think that is the case in California. Now, gentlemen, no body of laymen, however intelligent, is capable of deciding a medical question. I feel it is high time for the legal and medical profession to get together and work toward the solution of the expert testimony question.

Dr. N. H. Seemann (New Orleans): I am certainly delighted to have been enabled to be present and hear the kind and consistent and masterful exposition of this subject by Mr. Herold, and the one thought throughout his paper that appealed most forcibly to me was the judicial kindness that showed in every line of it.

Now, everybody wants to jump on the medical expert witness, and, because of the spectacular surroundings of a murder trial, where insanity is frequently the plea, why, more attention is directed to that particular branch of expert medical testimony than to any other. We have medical experts who testify in damage cases, some of them constantly appearing for the same insurance company. We have others appearing for the same lawyer, and we have experts in other lines of business.

When a man comes to a legal light, for instance, and tells this fellow he is as guilty as the proverbial gates of Hades, and this man begins to find a way out for him, I cannot see where a different code of morals can make that member of the legal profession correct in his actions, and then make the doctor who comes in and attempts to assist him with his knowledge any more guilty.

The same is true in regard to questions of the soul. We have experts in religion, priests and ministers and rabbis and so forth. The better part of them are good people; they help in this world. Now and then we have a small percentage of them who are rotten to the core. That does not detract from these noble professions, nor should we immediately abolish all forms of religion because some few of its proponents have gone wrong. We want to go about this thing rather sanely, and we want to protect our profession, as Mr. Herold has advised.

We jump on one another in the beginning and practically say that the whole idea of medical expert testimony is wrong, then we cannot blame other people in other professions from thinking so, because we have told them so ourselves. The ultimate cure of this thing is not going to be in legislation. I read (very boredly, I will admit), a report gotten up by the Bureau of Legal Medicine of the Medical Association, offering a plan whereby the judge would appoint three experts, which would be very similar to Dr. Stafford's advanced plan of a state lunacy commission. That commission, or those three men would be appointed either by a governor or by a judge, who would have his friends, his partisans. Human nature would come into play again.

The only solution of this, as any other question affecting honesty, is in the individual himself, the personal equation. If you have a good square shooter, (pardon the expression), in any business, you are going to get a square deal, but if he has anything in him that tends to crookedness, whether he be an architect, giving you an estimate on a building, or whether he be a road builder, giving

you an estimate on a contract for road building, or be a doctor, lawyer or anything else, if he is crooked it will show. If he is straight, you will get a square deal. That is all there is to it.

Dr. T. J. Perkins (Jackson): I feel that the State Medical Society owes the chairman of this section a debt of gratitude for having secured this excellent paper on expert testimony. I am profoundly interested in the question of expert testimony, because of the fact that I have charge of all the criminal insane in the State of Louisiana.

I cannot conceive of a medical man going on the stand and having anything in view in offering expert testimony in mental cases, except whether that man is insane, or whether he is not insane. We see, throughout the width and breadth of this land, physicians arrayed on either side of the question, one for the defense and one for the prosecution.

We must get away from that idea. Medical men are called in to determine a scientific fact in these cases, and they are not interested in anything except the scientific fact. I do not feel that this condition can be corrected until we have a State Lunacy Commission, and where the question of sanity arises in any case, the law should provide that it would become the duty of the judge to assemble the State Lunacy Commission to examine into the mentality of the individual in question, and their decision should be final as to the mental status of the accused.

I think it is time for the medical profession to take some action on the question of expert testimony, and I hope it will not be long before Louisiana will enjoy the privilege of being freed of medical men arrayed on either side in lunacy cases.

Dr. H. E. Bernadas (New Orleans): I just want to make a little statement in the question of expert testimony, whether conducted by a lunacy commission, by individual experts, would also resolve itself into a question of opinion. In these border-line cases, whether the gentlemen be on the lunacy commission or be medical experts employed by either side, the opinion is always apt to vary. Medicine is not only a science, it is an art, and there are few of us who can say definitely who is right and who is wrong in border-line cases.

We men who see cases just as we stand here, how many of us would look at a surgical case and say this case must be operated, and this case must not be operated and know definitely which is right. That same thing is going to apply in your lunacy commission, as it applied with the individual expert. You have, first, the question of honesty, and, second, to my mind, of equal importance, the question of individual interpretation, based on observation. That thing is apt to fail on either side, in your commission or your medical expert.

When you advocate a lunacy commission, you cast a doubt on the integrity and honesty of the individual experts, and I feel that doubt should not be cast by the medical profession.

Dr. Jabez N. Jackson (Kansas City, Mo.): We have as the subject before us this morning, I fancy, one of the most interesting topics for argument that we could produce, outside of strictly professional discussion.

In my early years in practice, I had a considerable amount of experience in testifying as expert technically in surgical cases, never as a neurologist. From this experience I become so absolutely disgusted with the whole scheme of medical expert testimony that I solved it for myself definitely fifteen years ago, when I decided that I would not testify as an expert under any conditions. And for the last fifteen years I have declined to examine, or to express an opinion upon a case where there was a suit involved.

Now, that is a condition to which many of us who are self-respecting are oftentimes driven, and it shows, therefore, fundamentally that there must be something wrong with the situation of expert testimony when a decent man hesitates to go into court.

Now, I am perfectly frank in saying two things, in the first place, that I do not believe that medical men oftentimes honestly differ in opinion, after competent, thorough investigation of the case. I believe that the average men will come to a conclusion, and to a correct conclusion in the large majority of instances, provided they are permitted to come to that conclusion without bias. In other words, that leads to the conclusion that in an expression of opinion on a professional subject, the opinion should be reached by unbiased means, which means that the expert should not be selected as representing either side of the question, and I believe, if that were the law, you would find very few instances of difference of opinion which brings the medical profession into disrepute.

I oftentimes have thought another thing, if the average lawyer in the beginning of his case was required to take the same oath that the witness takes, we would be better off. If a lawyer were compelled to swear that in the case now coming before the court, "I shall endeavor to elicit the truth, the whole truth and nothing but the truth," there would be less legal controversy.

In most instances, the lawyer on one side is trying to prove something to be true that he

knows, in the bottom of his heart, is not true, and it is very easy for him, with a fee advanced, to find a man who can honestly produce the weak arguments of a side.

There are no subjects which are absolutely without two sides to them, and it is very easy for a doctor, if he chooses to be an advocate, to strengthen those arguments which might be introduced for his side, and to gloss over the weak arguments. But if he were as a witness, someone summoned by a court to express an opinion to a court to render the decision, as far as the professional subject is concerned, there would be very few instances of differences in professional opinion. I do not believe that doctors inherently differ as widely as we are made to appear. I believe, fundamentally, therefore, that the medical jury should be an independent jury and should render a decision, and, therefore, I believe in the appointment of these expert commissions.

I do not know whether I would always agree in the point that selection of an expert jury should consist of a set of men officially selected, politically selected. I am not always sure that because a man happens to be the Superintendent of one of our insane asylums that he is the best neurologist, it isn't so in Missouri, a man may receive his appointment because he is a good politician, and fundamentally knows nothing about neurology when he gets the job.

I believe there should be a commission of men, an opinion from men who are known to be, and there is no difficulty for you gentlemen to know who your expert neurologists are in the State of Louisiana. I think that commission should be made by the State Medical Society, who are competent judges of the efficiency of the men. Fundamentally, were bias removed there would be little difference of opinion in a medical jury, and in cases where there is honest difference of opinion then the defendant should be given the advantage of the difference of opinion honestly arrived at.

Dr. C. V. Unsworth (New Orleans): As I am called upon very frequently to give expert testimony in mental and nervous cases, I feel as though I am in a position to say something on this subject. I do not feel as a great many of you do, that experts are not always honest in their opinions. I feel sure we have as many honest alienists in the medical profession as in its other branches. Probably this misunderstanding is caused by a lack of knowledge that the general public has, as to what constitutes the mental responsibility of an individual. We have often been accused of leaning towards the side by whom we are employed. This, of course, is not correct as a general thing, we are appointed by the court with a fixed compensation for our examination and report back to the court. In other words, we are part and parcel of the court. I am not in favor of legislation of the appointment of a Lunacy Commission, as I feel it is impossible to legislate against honesty. If such an idea that a Lunacy Commission was to be appointed, I am sure the Governor would have applications in great numbers from many who would not be competent to serve on such a commission. This would be particularly true if there was some compensation attached. To my mind probably the proper remedy for the evils in expert testimony lies in adequate amendments of the code of ethics by which physicians and surgeons regulate their own conduct. As one judge says, "by that code, you can regulate your own conduct in the practice of medicine, and insist that others who join the ranks of your profession from year to year, shall agree to regulate theirs.

Mr. S. L. Herold (Shreveport): I have little to say. The discussion seems to revolve itself around the question of medical expert testimony in cases where insanity is alleged in criminal cases, in other words, around such alienists as those who figured in the infamous case just ended in Cincinnati. That is hardly a fair test of the proposition which I attempted to lay down in the paper.

Medical expert testimony is called from the necessities of the case into various branches of litigation; not merely in murder cases, where insanity is pleaded by a rich bootlegger, but in cases involving the testamentary capacity of one who has died and left a will, and in cases where it is necessary to prove insanity or contractual capacity, where contracts are attacked as being made by one of unsound mind.

Medical expert testimony is necessary in many cases in regard to physical diseases, not merely mental, and as to the necessity of surgical treatment, just as expert testimony is necessary in almost every line of litigated cases that involves some particular technical or professional question. We have questions of disputed handwriting, we have questions of metallurgy, we have questions of patent law, we have many cases, because law is as varied and infinitely diversified as life itself. Expert witnesses are needed constantly in the courts in every variety of litigation as to every conceivable kind of question.

There is no more reason for attacking the validity of medical expert testimony than there is for attacking the testimony of one who has made a life study of mechanics with regard to whether a machine is patentable, or as to whether the invention has been anticipated by someone else.

There is no more reason for discrediting medical expert testimony than there is for questioning the testimony of an agricultural expert as to the quality of soil or the manner in which crops are

raised. Every man is, more or less, an expert in some line. Because a medical expert is employed by someone who needs to have medical advice, there is no more reason for questioning his testimony than to prohibit the testimony of employees of a corporation in behalf of the corporation. You had as well say they are biased or question the testimony of one who belonged to the same lodge or same church as a litigant. All those are matters revolving around the human equation. You cannot make men honest by law. You cannot make men decent or sober by law, as has been well proved.

I have a horror of law-making. Mr. Chairman, are you familiar with the fact that at the last session of the Legislature, in Baton Rouge, there were made and fabricated sixty-seven new crimes which were not crimes before 1926. They range in seriousness all the way from wearing a pin of a fraternal order, of which the accused was not a member, to the failure to obey the summons of the boxing commission. Do you want your profession regulated and "ham strung" by politicians who are elected to sit for seventy days every two years and draw ten dollars a day? Do you want a learned profession whose roots go back two thousand years, grounded in scientific training and in education, to be regulated and controlled by men who know nothing whatever of the traditions of your profession, of the thoughts and sentiments that underly it, of the knowledge upon which it is based, and who care less?

I take no stock in the statistics which the learned Chairman of this meeting has quoted. I do not doubt the authenticity of his statement as extracted from the newspapers, but I do challenge the statement that crime has increased in America, in spite of the contrary argument that we read in medical and legal periodicals. And when I say that crime has not increased I mean that those things which are really crimes have not increased. I absolutely deny the inherent right of any law-making body to make a crime. You can no more make a crime than you can make a disease. Just as a doctor makes his scientific investigation to ascertain and find new remedies for diseases, so does the lawmaker attempt, legitimately, to find new remedies for social diseases, for those things which are wrong in themselves.

We know it is wrong to murder; it is wrong to steal; it is wrong to rob; it is wrong to take advantage of certain confidences; many things are morally wrong, and the wrong-doing appeals to every normal mind. But when the legislature sits down in its omnipotence to declare that things are crimes that are not criminal to the normal human mind; when the legislature sits down to make those acts criminal which the normal person does without any feeling of conscious wrong-doing, then it is stepping beyond the proper sphere of legislation, and making rules which may incur penalty by their violation, but which are not, in themselves, crimes. And it is precisely because these rules have been made by the bigots, by the forty-nine legislatures and by the busy Congress in Washington that we have this enormous pseudo-criminal wave.

I challenge the statement that there has been any appreciable increase, or that there has been any increase in murders, in rapes, in burglaries, in larceny, or any of those things, which are really a crime to the average human being. Chicago, of course, excluded.

I know that in my parish, which is rather typical of the whole Southwest, I have made a very careful study, together with one of the judges of the criminal court, and we have come to the conclusion, after careful study, that there is much less crime in Caddo Parish, much less violent crime in Caddo Parish, very much less crime in proportion to the population in Caddo Parish, in proportion to the population thirty years ago, if you call crime those things which we know to be wrong whether there is a law or not.

There is an increase if you consider crime the violation of the Volstead Act and those other acts penalized by the reformers who set aside those guarantees that the founders of this nation had been so careful to preserve for the individual liberty of the individual citizen. If I am accused of murder, and I plead insanity, I may be insane; it is not due process of law to leave the question as to whether I shall be hung or not, or whether I shall be imprisoned in the penitentiary to any body of experts, however learned. They are wholly incapable under our scheme of government, under the Bill of Rights of the American Constitution and under the Constitution of Louisiana and the principles underlying these fundamental rights, they are absolutely incapable of saying whether I shall be hung or deprived of my liberty.

Tradition of six hundred years requires that I be considered innocent until I am conclusively proven guilty, and that I retain my life and my liberty until I am convicted, not by experts, but by the constituted authorities consisting of court and jury. They derive the basis of their conclusion from facts, from witnesses.

Those witnesses may testify to concrete facts upon which they are as apt to differ as experts are; they are equally apt to differ as to exactly what they saw and what they witnessed; or their testimony may consist of the conclusion of experts who, by reason of their particular knowledge of the subject, are capable of expressing an opinion, but, after all, under our scheme of things, under our charter of liberty, under our system of gov-

ernment, that testimony, whether it be as to facts or opinions, must be weighed by the constituted authorities and court and jury, each in its proper sphere.

Until this is done, I cannot be deprived of the rights of a free man, and what I say as to criminal law is equally applicable to my civil rights—my rights must be adjudged not by experts, but by the court—that branch of the government to whom has been confided by the people, under our American traditions, the power of judging.

The court may derive its conclusion from the testimony of witnesses as to concrete facts; the court may derive its conclusions from the testimony of men skilled in their profession or occupation, as to their conclusions from the facts; in either event, the constituted authority, the judicial branch of the government passes on those facts, and I cannot believe the American people will ever content themselves with leaving the decision of their, life, their liberty and their property to a body of experts, not subject to examination and cross-examination in open court. That is the basis of my observation.

THE FULL TIME HEALTH PROGRAM DEVELOPED IN THE MISSISSIPPI VALLEY FOLLOWING THE FLOOD.*

J. G. TOWNSEND, M. D.,

KANSAS CITY, MO.

EMERGENCY SANITATION.

The flood caused by the waters of the Mississippi and its tributaries, which occurred in the spring of 1927, was one of the largest and most extensive in the flood history of this river. The States flooded were:

Arkansas	Mississippi
Kentucky	Missouri
Louisiana	Tennessee

Illinois, to a small degree, also suffered from the effects of the high water.

The total acreage flooded has been estimated to be nearly thirteen million. This represents 20,000 square miles. The number of people affected in this area is estimated at 908,185. With such a large area involved, sustaining a population of nearly a million people, the question of the public health was one of greatest importance.

In order to care for properly and house the individuals who were forced from their homes, the American Red Cross, with its usual efficiency in such disasters, organized and operated 149 concentration camps in the area caring for 330,000 people. The distribution these camps was as follows:

STATE	Number of Camps	Maximum number people cared for in camp
Arkansas	62	133,800
Illinois	6	2,500
Kentucky	2	2,200
Louisiana	33	105,400
Mississippi	23	64,800
Missouri	18	14,000
Tennessee	5	7,300
	149	330,000

These people were not only housed and fed, but the care of the sick, as well as the prevention of the spread of contagion was also an important feature of what might be termed the emergency flood sanitation program in contra-distinction to the permanent post-flood program which was soon to follow.

In order to assist the local State health officers and local county health officers in combating this problem, much assistance was received from neighboring States in the furnishing of personnel and biologics.

The United States Public Health Service furnished twenty-four doctors, eight sanitary engineers and five scientific assistants, thirty-seven in all. The neighboring States furnished eighty medical officers, engineers and inspectors, and medical personnel was also furnished by the International Health Board. This personnel was detailed only through the requests of the State health officers and assigned to the State Boards of Health. Their work consisted in—

(1) Measures toward the safe disposal of excreta through proper latrines in proper locations, properly policed.

(2) Safe water supplies.

*Read before Louisiana State Medical Society, Baton Rouge, April 10-12, 1928.

(3) The inspection of food and milk supplies furnished concentration camps.

(4) The isolation and quarantine of communicable diseases, and

(5) The immunization against typhoid fever and smallpox.

It has been estimated that in all the States in the flooded area 469,442 individuals were immunized against typhoid fever, receiving three inoculations, while 137,340 individuals were vaccinated against smallpox before the permanent health program began to function subsequent to July 1, 1927.

CONTROL OF MALARIA BY MEANS OF SCREENING HOUSES OF MALARIA CARRIERS.

This program, developed in the late spring and early summer of 1927, financed by the Red Cross and supervised by engineers of the U. S. Public Health Service under general supervision of Senior Sanitary Engineer J. A. LePrince, was based on the premise that the major part of any potential spread of malaria would be on the plantations, and that the most effective way of reducing the spread of malaria would be to prevent Anopheles having access to malaria carriers at the farm tenant houses so long as the limited time available and the available funds would allow. The work was organized in Arkansas, Mississippi, Louisiana and the western portion of Tennessee, this being the first time that so extensive a program had been carried out in this manner.

The plan of procedure was to visit as many homes as possible in the flooded counties to determine whether or not cases of malaria carriers were living there and to screen completely such homes, making them mosquito proof. This was accomplished by inspectors at the time of their visit, taking measurements of doors and sending them to a central point in the State where screen doors were made in conformity with such measurements and shipped to the communities in carload lots, where they were hauled to the plantations by the several plantation owners. The Red Cross assisted the State health departments and co-operating agencies in supplying these inspectors, and also supplied the materials for screening and transportation from the factory to the local communities.

Wire screen was used for all doors and windows with the exception of some homes where a specially prepared netting was used for windows.

The plan of procedure in Louisiana differed from that in other States. Here the State Board of Health located and listed the malaria carrier farm tenant homes in eight parishes, while the Assistant State Sanitary Engineer supervised the construction of screen doors, their shipment, and the installation of all protective screening.

In Arkansas the screen doors were made at the Boys' Industrial School at Pine Bluff; in Mississippi at Greenwood; in Louisiana at the State Boys' Industrial School at Monroe, while in Tennessee the Manual Training Department of the public schools at Dyersburg accomplished the work.

This feature of the health program was extensive. The distance from the north to the south end of the entire project was about 320 miles, and the homes to be screened were scattered over 36 counties of four States. Each of the malaria case homes had to be sought for and the dimensions of the doors made. In the making of doors about 19 tons of twenty-four inch sheet steel had to be cut into 337,680 small triangles for screen door enforcement plates and each triangle had to have holes punched to receive the nails. About 50 miles of sixteen mesh wire screen had to be placed on door frames with a minimum of wastage in addition to the seven miles of cotton mosquito bar used on the window frames in some of the counties in Arkansas.

The actual work accomplished in the project was as follows:

	Tennessee	Arkansas	Mississippi	Louisiana	Four States
Flooded Counties Where Homes Were Screened	4	15	9	8	36
Homes Screened	483	2348	3276	653	6761
Doors Screened	1440	7304	10,238	2,193	21,175
Windows Screened	2387	12,200	12,931	2,777	30,295
Average Cost of Screening a Farm Tenant Home	$ 11.68	9.67	11.07	13.99	11.02
Total Cost	$5,630.87	$22,707.35	$36,254.39	$9,883.00	$74,475.61

Note—This table is taken from the report of Senior Sanitary Engineer J. A. LePrince, U. S. P. H. S.

The labor cost of making these doors was about twenty-seven cents per door, the average door costing in all about $1.40 complete. It is realized that all homes with malaria carriers were not screened, only a proportion were, but the fact that nearly 7,000 homes were screened in a period of approximately 90 days is a good start, especially when it is recognized that so far as it was possible to determine these homes represented places where malaria cases reside and that the number of families containing malaria cases capable of infecting others is but a small proportion of the surrounding farm homes in the vicinity.

The work of further extending the screening program now rests with the full time county health units, the creation of which was the last step in the flood health program, or which might more properly be termed the post-flood program.

FULL TIME COUNTY HEALTH UNITS DEVELOPED AS A RESULT OF THE FLOOD.

The program just discussed might be properly termed actual emergency programs, which, of course, were limited to immediate needs, but a time came when the strictly emergency work was curtained or discontinued as the situation was relieved. It was recognized, however, that a serious problem still existed. In the majority of the flooded counties there were no organized public health agencies to carry on the preventive measures started to a logical conclusion and with slight prospects of developing a program, as the counties affected had very little money to appropriate for this work, in some instances being in actual financial straits.

It has long been recognized that the best public health program and one that will best insure permanency is the full-time county health unit plan, the community served enjoying the services of a full-time director, full-time nurse and full-time sanitary inspector. Some communities have more personnel, some less, but that is the standard.

At a meeting in New Orleans, June, 1927, attended by representatives of the Public Health Service, Rockefeller Foundation, American Red Cross, and various State Boards of Health, it was recognized and agreed that some such plan should be formulated and such a program fostered in the so-called flooded counties. This was made possible by a liberal contribution from the Public Health Service and International Health Board supplementing county and State funds, the counties being asked to appropriate a very small part of the total budget necessary to finance the health units. It was agreed that this fiscal plan would be in operation for eighteen months, that is to say from July 1, 1927, to January 1, 1929.

Representatives of the Public Health Service and International Health Board assigned to the various State Boards of Health assisted the State health departments in laying this proposition before the various county officials, and organizing the programs adopted. Of the 103 counties considered flooded in the six States, 85 were visited and this plan presented to the local governing authorities. The result was encouraging in that sixty-seven, or 78 per cent signed the budget and definitely com-

mitted the county funds to the project as of October 31, 1921.

Since the October figures were compiled, four additional flood parishes of Louisiana adopted the full-time plan, while two more committed to the project were organized. These six parishes started to function on the first of the year. This gives Louisiana 19 parishes organized on a full-time health plan since the flood.

The total number of counties adopting the full-time plan to date, including those in which no county funds were committed, is 78, or about 92 per cent of the total contacted. There were a few counties that actually had no money whatever to put into a health project, and in these the Public Health Service, International Health Board and State Boards of Health financed the projects temporarily with a limited personnel. In many counties the work was made possible by donations from the local Red Cross chapters, municipalities, chambers of commerce and civic organizations.

As is generally the case in the organization of full time health units, a difficulty of no mean proportion was that of finding suitable trained personnel to carry on the work. In order to meet this difficulty and facilitate the speeding up of the program the International Health Board organized training schools for the practical teaching of field public health work to prospective health officers, nurses and inspectors. The principal school was located at Indianola, Mississippi. Without exception the states developing the full time rural program sent trainees to this school. The International Health Board approved the training of the candidates upon request of the various State Boards of Health. Those accepted were given a grant of their railroad and pullman fare from their homes to the training school and return to the new field of duty as well as a per diem allowance while enroute and at the school. The number of trainees sent to the school, as of March 15, 1928, is given in the following table:

STATE	Physicians	Nurses	Inspectors	Total
Arkansas	20	23	17	60
Kentucky	10	29	16	55
Louisiana	13	7	24	44
Mississippi	4	12	19	35
Missouri	0	0	7	7
Tennessee	1	0	0	1
Total	48	71	83	202

Not all of these trainees were placed on duty through failure to qualify and resignations, while some were appointed without being sent to the school. This does not include the twenty-four office clerks on duty as of October 31, 1927.

The International Health Board submitted an appraisal on each trainee which was of inestimable value to the State Boards of Health in determining the fitness and ability of the persons seeking these positions.

The public health programs adopted in these full time projects were along the same standard lines as elsewhere enjoyed. In brief, activities were directed towards safeguarding the health of the child from before birth to adolescence through the media of pre-natal, infant, pre-school and school hygiene. This was accomplished through group conferences or clinics and the intensive physical inspection of school children for the purpose of locating physical defects and advising the parents to have corrections made through the family physicians. Concomitant with this program were educational measures in newspaper articles, lectures and the distribution of pamphlets. The local profession was encouraged to report communicable diseases and proper steps taken toward isolation and quarantine. Prevention of soil polution was affected by sewer connections when possible and the construction of the vault type of sanitary privy through personal persuasion and the enforcement of the existing ordinances. The inspection of food and milk supplies, the vaccinations against smallpox, inoculations against typhoid fever and diphtheria were also stressed and emphasized. A resume of the

work of these full time projects in the Mississippi Valley from July 1, 1927, through the month of February, 1928, is given in the following table:

JULY 1ST, THROUGH FEBRUARY 29TH, 1928.

1.	Educational:	
	(a) Lectures	5,152
	(b) Attendance	166,996
	(c) Bulletins distributed	201,361
	(d) Newspaper articles	5,807
	(e) Circular letters	38,229
	(f) Health exhibits	319
2.	Sanitary Inspections:	
	(a) Private premises	37,749
	(b) Public premises — schools, churches, etc.	7,848
3.	Special Inspections:	
	(a) Dairies	1,028
	(b) Other food-producing or food-handling places	4,757
4.	Examinations:	
	(a) For life extension advice	470
	(b) For work certificates (children)	26
	(c) For lunacy	112
	(d) Of prisoners	847
	(e) Of food handlers	266
5.	Acute Communicable Disease Control:	
	(a) Visits to cases, carriers, contacts or suspects	11,673
	(b) Cases of carriers isolated or quarantined	5,831
6.	Venereal Disease Control:	
	(a) Suspects examined	1,191
	(b) Prophylactic treatments	48
	(c) Curative treatments	1,675
7.	Tuberculosis Control:	
	(a) Number examined	775
	(b) Positive	170
	(c) Negative	269
	(d) Placed in institutions	232
	(e) Home visits	1,132
8.	Persons Treated Hookworm Removal	18
9.	Persons Treated for Prevention or Cure of Goiter	16
10.	Shick Tests	4,075
11.	Cows Tuberculin Tested	3,587
12.	Immunization:	
	(a) Complete antityphoid administrations	91,173
	(b) Antismallpox vaccinations	42,045
	(c) Complete diphtheria toxin-antitoxin administrations	30,843
	(d) Persons given prophylactic diphtheria antitoxin	640
	(e) Persons given antirabic treatment	74
13.	Child Hygiene:	
	(a) Prenatal—	
	(1) Cases given advice	881
	(2) Examinations	266
	(3) Office consultations	769
	(4) Group conferences	120
	(5) Home visits	1,287
	(6) Midwives instructed	2,725
	(b) Infant and pre-school—	
	(1) Babies and children examined	4,371
	(2) Office consultations, mothers	2,385
	(3) Group conferences with mothers	467
	(4) Home visits	4,966
	(c) School—	
	(1) Children examined	113,394
	(2) Found defective	69,453
	(3) Defects found	136,030
	(4) Consultations, parents (office and school)	3,547
	(5) Home visits	18,098
	(6) Talks to classes or drills in hygiene	4,769
	(7) Exclusions for communicable disease	2,620
	(d) Nutritional classes—	
	(1) Cases attending	3,352
15.	Laboratory Examinations:	
	Specimens—	
	Blood for Widal	118
	Blood for B. typhosus	20
	Blood for Wassermann	1,654
	Blood for malaria parasite	4,791
	Smears for B. diphtheria	2,314
	Smears for gonococci	260
	Sputum for B. tuberculosis	446
	Feces for parasites	1,015
	Water for B. coli	1,453
	Milk for high bacterial content	255
1.	Sanitary privies installed:	
	Type—(a) Septic or L. R. S.	58
	(b) Water-tight vault	9
	(c) Bucket and box	38
	(d) Pit	9,037

2.	Privies restored to sanitary type	1,210
3.	Septic tanks installed	138
4.	New sewer connections	1,659
5.	New water connections	336
6.	Wells or springs improved	2,556
7.	Public milk supplies radically improved	178
8.	Public food handling places radically improved	867
9.	Places producing foods for sale radically improved	196
10.	Dwellings effectively screened against flies and mosquitoes	2,524
11.	Stables made sanitary	56
12.	Nuisances corrected	2,505
13.	Convictions for violation sanitary laws	5
14.	Nutritional cases improved	688
15.	Corrections of physical defects induced:	
	(a) Infants	)
	(b) In pre-school children	)
	(c) In school children	) 10,241
	(d) In adults	)

(Note): These figures present the public health activities carried on in the newly organized counties and parishes from July 1, 1927, to date, and do not include any activities carried on in the eighteen full time county health projects in the several states which were organized and functioning before the flood. It must also be remembered that many of the flood counties were not organized and operating until the late fall of 1927, while some were not organized until the first part of this year.

MEASURES TAKEN IN THE CONTROL OF PELLAGRA.

The diseases which showed the greatest increase during the post-flood period were pellagra and malaria. On the morbidity reports submitted from the six states a definite increase in the pellagra rate was shown with the exception of Missouri where no cases whatever were reported and Kentucky where only thirteen cases were reported for 1927. The greatest increase was shown in the State of Mississippi where there were reported nearly 4000 cases in the four months period, July to November, 1927. Only 700 cases were reported for the corresponding period in 1926. A marked increase in the pellagra rate was also experienced in Arkansas.

The only measures taken to combat the pellagra rate were through the medium of the distribution of dried brewers' yeast which was generously supplied by the American Red Cross to various state boards of health. This was distributed through the full time health departments who in turn, in many instances, utilized the farm demonstration agents and other local organizations. In some instances, tomato juice in a limited amount was also distributed.

MALARIA CONTROL.

In the control of malaria emphasis was placed on the continuance of the screening program previously discussed. Although at present the work is not being done free of cost to the owners of homes, at the same time the comfort of properly screened houses was amply demonstrated and it is believed that a renewed interest in this phase of malaria control is developing. From the reports submitted by Mr. LePrince on the results of the screening program of last summer it was learned that in some instances county health officers have demonstrated at county agricultural fairs how substantially made screen doors can be constructed by farm tenants. In two parishes in Louisiana the health officers undertook a project which includes the screening of all malaria families in his parish. In other states the work is under way for the protection by screening of all malaria homes in malaria counties. (Work is now going on in 6 counties of five states as reported by Mr. LePrince, March 19, 1928.)

The free distribution of quinine in the form of capsules, pills and tablets was also carried out by the full time health departments through the medium of local organizations, quinine being furnished by the American Red Cross. At the present time,

however, the Red Cross has retrenched considerably in its policy of supplying this commodity as well as yeast in the control of pellagra.

CONCLUSIONS.

We are not unmindful of the disaster of last spring but some comfort can be obtained in the knowledge that better communities are builded on the ruins of those destroyed and as a rule a better public health regime inaugurated. Surely in this experience there has developed another flood; a flood of sanitation which has placed us many years ahead of our old program of full time health development. The fact that since last July 78 counties are enjoying adequate public health protection through the labors of over 200 full time health workers is a distinct step forward and a stimulus to perpetuate these endeavors. This can be done by creating such a popular demand for full time health protection that it will merit the same consideration in local government as an "educational program" or a "good roads program."

It is not too much to believe that this will be accomplished and that the Mississippi Valley will enjoy the universal public health protection it deserves.

DISCUSSION.

Dr. C. C. Bass (New Orleans): I am sure I voice the feeling of all others in expressing appreciation of the work done by the Public Health agencies in the health program that was so successfully carried on following the flood. It frequently takes great catastrophies to induce people to put into effect the measures for prevention and control of disease that are already well known.

One of the best examples of the necessity for special demand to bring about the proper reforms and to force people to employ available means was the control of yellow fever in 1905. Five years after the method spread, and then the method of control was well known, New Orleans and the other parts of this country were just as full of yellow fever as it was before the information was at hand. But whenever the epidemic of yellow fever came, then the people woke up and eliminated those conditions which made it possible for the disease to exist and spread. The same thing has occurred with regard to plague.

During the flood period, I remember hearing many people say that perhaps the flood would finally prove to be a blessing in disguise. No doubt, those who were in the flooded district found the disguise very perfect. This Health Program that has been so much speeded up by the opportunity that was presented and the demands that were presented, has certainly been one of the blessings in disguise, of the flood.

The County Health Unit is destined to be one of the organizations of government in all well developed, highly civilized sections of the country. It seems that the county is the ideal unit, and, barring the few large cities where there may be municipal health units operating independently to advantage, the county unit is the most successful.

The demonstration that has resulted from the success of these health units and that have resulted from health units in other parts of the country show beyond question that whenever the time arrives, whenever the demand is sufficiently great, whenever the people are sufficiently well aroused to the opportunity and the need, then it is possible to put into operation a health organization, which can control most any of the communicable diseases, and contribute, perhaps, more largely to the welfare of the people than a similar amount of money or effort put into any other activity.

Dr. Oscar Dowling (New Orleans): I wish to express appreciation to the United States Pubilc Health Service, the Rockefeller Foundation, and especially to the doctors of the State of Louisiana for their co-operation during the last flood. The doctors were wonderfully helpful. This was verified by a statement made by Dr. M. C. Reeves of Vidalia a week ago. He told me that everybody in his vicinity was vaccinated against typhoid, for which service he had not received one cent of compensation from the Red Cross or from any other source, and there had not occurred a case of typhoid in that community.

We were very happy to emerge from the flood wi'h health conditions better than before. It was due to the splendid co-operation of the doctors and the help of the people who realized that our program was pertinent to conditions and meant control of disease. I want to quote from an address—I read this night before last—made by Dr. Formento before the American Public Health Association in Mexico City in 1892, in which he said:

"Every citizen today fully understands the importance, the necessity of a pure water supply, pure milk and wholesome food, removal of nuisances, ventilation, drainage, sewerage, paving of

streets, etc. Everyone appreciates the benefits of hygiene in all its branches and numerous applications. Never was there a more propitious time to agitate this great question of public sanitation. Governments and individuals begin to fully realize that sanitary improvement is a good investment—that hundreds or thousands spent in that direction will bring back millions and millions, to say nothing of the added value of increased population and diminished death rate. It pays to enforce sanitation . . . .

"On the subject of alimentation we will say that the necessity of meat inspection as well as that of a fixed standard to determine the quality of milk, and the prohibition from the market of tuberculous milk and meat, are now recognized by all sanitarians, and sanitary laws to that effect are being gradually adopted and enforced in every country."

The important part to me is that this statement was made in 1892, and up to the present time we have not succeeded in convincing a number of our communities, among which are some of the largest, of the need of standardization of the milk supply. I hope it will come in the near future.

Based on past experience, I feel safe in saying that the time is not far distant when all communicable disease will be controlled in the State of Louisiana, as has been yellow fever.

Chairman Fred Mayer (Opelousas): Is there any further discussion? It is a strange phase of mob psychology in Louisiana that we have been whipped into a fever of excitement by some spectacular disease, like yellow fever, and pay absolutely no attention to those diseases that steal in like a thief in the night, "T. B." or typhoid.

Our Board of Health, in 1906, through wholesale fumagation, in New Iberia, stamped out a case of yellow fever, and prevented a spread for the first time in the history of the South, before frost in a year following an epidemic year. The town, whipped into excitement, paid absolutely no attention to an epidemic of typhoid that had carried off sixty cases, and, of course, as usual, paid no attention to "T. B.", which there as elsewhere, continued to ply its deadly work.

It is a strange phase of human nature that I have never been able to understand; the measures taken to stamp out yellow fever, directed primarily against that disease, stamped out the epidemic of typhoid and, incidentally, malaria, and the doctors for a year and a half were short of malaria cases, as a result of the measures directed against yellow fever. And incidentally, the people for the first time in forty years sat on their galleries without being pestered with mosquitoes, but when the danger of yellow fever passed away, they lapsed back into their old methods and indifference with the usual malarial incidence, hence the necessity of constantly preaching hygiene and sanitation.

Dr. Oscar Dowling (New Orleans): The question raised by Dr. Willis in reference to educating the public is provided for in the requirements for the Health Officer. There are certain duties the Health Officer shall perform, but the directors of Health Units do additional work. The added activities do not excuse the director from performing routine duties, and undoubtedly they would have the community meetings or community clubs and have specific dates for lectures. Where the director desires help the State Board of Health will arrange to provide an additional lecturer.

May I bring to your attention that the law says each parish shall have a Health Officer. If we had the support of the doctors in the state we would have an efficient health officer in every parish of the state. The matter of compensation was decided by the Supreme Court, which ruled that the minimum salary for a health officer was three thousand a year with six hundred dollars for traveling expenses and four hundred dollars for incidental expenses.

The State Board of Health stands ready to provide for every parish in the State which desires to undertake full-time health work and will put up $4,000. Where this is done the work is carried on more effectively. I bring this to your attention and ask your co-operation in seeing that we have effecient health departments in every parish in the State.

NINE YEARS GOING BEGGING.—There are communities in the South and Southwest where the most modern practice has been adopted; but there are still others in which conditions are utterly at variance with the high level of prosperity and intelligence characteristic of the nation as a whole. There are no public channels into which the South can more wisely pour liberal appropriations of its new-found wealth than those which lead to health, comfort and the prevention of disease. No one knows this better than the medical men of the South. Parts of the North and Northwest are equally behind. Nothing is too good for them in the way of tangibles. They have costly roads, motors, radios, musical instruments and all the amenities of modern American life. It is right that they should have them; but it is not to their credit if they neglect such intangibles as health and education.—Editorial; Saturday Evening Post, August 25, 1928, p. 22.

THE PROPHYLAXIS OF CANCER, WITH SPECIAL REFERENCE TO THE CERVIX UTERI.*

C. JEFF MILLER, M. D.,

NEW ORLEANS.

Every year 500,000 people die of cancer, 100,000 of them in the United States alone. It claims its victims at the rate of one in every four minutes, and it more than equals the combined annual devastation of storms, earthquakes, floods and volcanic eruptions throughout the world. Between the ages of forty-five and sixty-five one woman in every five dies of it, with carcinoma of the cervix uteri responsible for more than half of these deaths, and the United States leads the world in the prevalence of genital carcinoma.

Moreover, within the last twenty-one years—I am quoting from Schereschewsky's brilliant report in the United States Public Health Reports for 1926—within the last twenty-one years, while the death rate from tuberculosis has decreased 40 per cent and the death rate from typhoid has decreased 50 per cent, the death rate from carcinoma has actually increased. It has not remained merely stationery, which would be black enough, but it has actually increased. It must be granted that a portion of this increase is apparent rather than real and can be explained in two ways. In the first place, death certificates are now being filled out with greater accuracy and precision. In the second place, at least in civilized countries, men and women reach a greater age and possess a higher degree of longevity, so that, as one writer puts it, every person saved from death in youth is one more potential victim for cancer in old age. Granting all of this, however, the fact still remains that part of the increase is real, and in view of the generally decreasing death rate for other conditions, an actual increase of at least 25 per cent in the death rate for cancer in less than twenty-five years cannot be viewed with complacency by the medical profession or with equanimity by the laity.

Statistics are notoriously unreliable, but these figures permit of no argument, and they are my apology, if apology be needed, for presenting again a subject to which I can add nothing new and on which I can probably say nothing that you do not already know. But it seems to me, even at the risk of being monotonous, that it is not amiss for us to study the situation again, to take stock of our knowledge of this hitherto invincible disease, and to consider how we are fulfilling our responsibility to our patients and to the public in what we are doing for it.

As Graves pointed out in his scholarly paper before the Sixth British Congress of Obstetrics and Gynecology which met at Manchester in 1926, in the combat with any given disease three factors must be considered, the essential or primary cause, the exciting or secondary cause, and the cure. We do not know the primary cause of cancer and our efforts to prevent it are therefore largely strokes in the dark. But we do know definitely its secondary or exciting cause, and efforts to prevent it, intelligently and intensively directed, would do much to lessen the incidence of the disease. And we know absolutely the cure, complete excision of the growth while it is still a local condition. That the disease is, relatively speaking, so seldom cured, is not a refutation of this fact but rather a reproach to us of the profession who fail to see it at this stage, partly because we have not educated the laity to seek out promptly, partly because we are prone to trifle with the condition even when it is brought to our attention.

I have only admiration and respect for the work that is being done in laboratories and clinics all over the world in the scientific study of cancer, and I know that our ultimate success in the combat with it will be due entirely to that work. I hope there-

*Read before Louisiana State Medical Society, Baton Rouge, April 10-12, 1928.

fore that you will not misunderstand me, that you will realize that I am in no way disparaging the efforts of these tireless students, when I say that until their work is complete, until the ultimate cause of cancer is identified, the key to success in the management of it does not lie in their hands. It lies rather in our hands, we men who are clinicians rather than scientists, and particularly it lies in the hands of the family physician who usually sees the patient first, and in the hands of the gynecologist to whom she is usually sent for treatment.

It is not my intention to dwell upon the pathology of cancer or to discuss at length the various theories of its origin, but because prevention and treatment are so largely based upon etiology, that phase of the question can be completely ignored. While we are still in the dark as to the ultimate cause, we do know that cancer is in all instances due to an abnormal growth, a running wild, so to speak, of normal cells which have lost the power, undoubtedly possessed by them though as yet unidentified, of inhibiting the size and growth of their tissues. Eventually these cells which grow out of their natural environment and beyond their natural boundaries destroy first the local tissues which feed them and finally the entire host. That is, cancer is essentially a perverted biologic process, an atavistic throw-back, as Blair Bell puts it, of the somatic cell to its earliest embryonic type because of the failure of its restraining hormone.

The primary cause of this perversion we do not yet know but the exciting or predisposing cause is very clear. Chronic irritation, no matter what form it may assume, probably lies back of every cancer of which it is possible to conceive. First advanced by Virchow and by Billroth, and for many years established only from the clinical side, in the last fifteen years this theory has been repeatedly proven from the experimental side also. The work of Jones, under the auspices of the Cancer Commission of Harvard University, is particularly conclusive and may be quoted as typical of all such investigations. Her report is based upon a study undertaken to determine the susceptibility or immunity of mice to a certain type of transplanted malignant tumor, the strain in which it is originally found being susceptible to its transplantation in 100 per cent of all cases; that is, the transplanted tumor always grows. On the other hand, mice of another strain are completely immune to it under ordinary circumstances; that is, the transplanted tumor never grows. But—and here is the crux of the investigation—the addition to the inoculated tumor of a piece of sterilized flannel results in the development of malignancy in about 15 per cent of the animals. That is, without considering other factors, local irritation, no matter how simple or how favorably introduced, if we may employ such a term, will cause malignancy and will overcome even an inherited immunity which, without such irritation, is capable of preventing any growth whatever.

Fitz-Patrick has recently advanced a special theory for uterine cancer which I quote to you, without comment, for what it is worth. It is his idea that there may be a possible connection between the rapid increase in the incidence of uterine cancer and the corresponding decrease in the bearing of children, since uterine and mammary cancer are increasing most rapidly in those countries in which race suicide is most prevalent. That is, by his theory a woman who persists in marital relations, which reflexly cause in the uterus the changes incident to pregnancy, but who at the same time repeatedly avoids childbearing, is misusing her organs and is not functioning physiologically. The virgin, on the other hand, even though she does not bear children, is not misfunctioning. The theory is fanciful and as yet there is nothing to substantiate it, as its author is the first to admit. But he believes that special investigation along this line may be worth

undertaking, and he quotes in its favor Gideon Wells' suggestive statement that the dairy cow, which has the most overworked mammary gland in the world, never develops cancer, while the human subject which does less work in bearing children than any other animal, is the only one which has cancer of the uterus with any degree of frequency.

Diametrically opposed to this view is the long accepted theory that cancer of the cervix develops because women have had children. Certainly the figures seem to support this belief, though recently it has been suggested that they may be capable of another interpretation, and we are coming to believe that it is not the actual child-bearing which is important, or even the trauma which results from it, but the inflammations and infections which follow that trauma. The sequence of events is quite clear. Cancer never develops in healthy tissues. The process of child-bearing, even if normal and physiologic, furnishes always a certain amount of trauma; if it is pathologic in itself or if it is improperly managed, that trauma is exaggerated. The injuries thus caused furnish a ready soil for infection, and the infection in its turn results in inflammations, foul discharges, and finally erosions which are characterized by hyperplasia, proliferation and cystic degeneration. This is particularly true of erosions of the papillary type, and Matthews and others have called attention to the fact that they have inherent in them all the hallmarks of malignancy, and that it is but a step from the extreme cell proliferation with orderly arrangement which occurs in marked hyperplastic endocervicitis to the disorderly arrangement with embryonic cells which is found in true malignancy. The sequence has been proved too many times to make it longer a matter of dispute. I am aware that pathologists object to the term precancerous on the ground that a condition is either malignant or it is not, and academically they are correct, but if ever the term is used justifiably it is certainly in such cervical conditions as these we have just been discussing.

From the clinical side the proof is equally clear. It is supported by incontrovertible statistics and by the observations of many skilled clinicians. The incidence of obstetric lesions preceding cervical carcinoma is variously estimated at from 90 to 98 per cent, and in those instances in which there is no story of child-bearing, investigation usually brings to light a history of long-standing pathology ranging from inflammations to new growths. As Graves has well said, in the traumatized, lacerated, infected cervix are found all the elements favorable for carrying out in the human being the experiment of cancer production. Whether he is equally correct in emphasizing as strongly as he does the rôle which gynatresia plays in its production it is still not possible to say, but certainly it is a factor which cannot be altogether disregarded.

So much, then, for what we know of the etiology of cancer and especially of cancer of the cervix. Our knowledge is limited, it is true, but is it sufficiently limited to explain the appalling incidence of the disease throughout the world and to explain the appalling mortality, the tremendous economic and social losses, which follow in its wake? Are we as free from blame in the matter as we are wont to believe? And if not, how are we to improve the situation?

Leaving aside for the moment the matter of public education in this regard, let us consider our personal responsibility. The most eloquent news article, the most effective editorial, will never equal the personal instruction of the trusted family physician. Women must be taught to lay aside their dread of pelvic examinations. They must be taught that genital health, if I may so express it, is an integral part of their general bodily well-being. They must be taught to consult the physician not only when they suspect that something is wrong,

but even when they are sure that nothing is, as a sort of insurance against evil. Routine pelvic examinations at regular intervals during the cancer years and even before them would do more than any other thing to lessen the incidence of the disease and to reduce its mortality. And that ideal, Utopian though it be and far-off though it seem, is not impossible of attainment if we of the medical profession set it before ourselves as a definite goal.

Specifically, women must be taught that a vaginal discharge is never physiologic; that irregularities of menstruation are not normal at any age and are not more normal at forty-five than at twenty-five; that bleeding is not a natural accompaniment of the menopause; and that neither discharge nor bleeding ever occurs from a healthy uterus when once menstruation has ceased. Finally, they must learn that pain is not an early symptom of cancer and that the woman who deludes herself with the belief that because she has no pain she cannot have cancer is going later to pay the price of her false security.

It is equally important that women be taught the truth about cervical injuries and cervical infections. They must learn that a healthy cervix is the best possible safeguard against the development of malignancy. Here the responsibility of the physician is quite clear, and yet we still find men, many of them, who advise deferring the correction of cervical injuries until the patient is past her child-bearing years, with a blissful disregard of the fact that by that time irrevocable damage may have been done to the pelvic structures and malignancy may have become an actuality instead of a potentiality. Such treatment, too, must be undertaken promptly, not after the changes have occurred which may later produce cancer. The exact interval after childbirth, provided it be reasonably prompt, is not a matter of great moment, though I may say in passing that except in the occasional case I am not an advocate of routine cervical repair immediately after delivery.

That such a plan, consistently followed, actually does prevent malignancy is overwhelmingly evident. Graves' figures, the latest I have at hand, show that in a series of roughly 5,000 cases studied by him in which cervical repair had been done, only four patients later developed malignancy, and in two of these the operation was unskillfully performed and defeated its own end in that a definite stenosis of the canal resulted. While the figures are not conclusive in that they have not been checked by an equally large control series in which cervical repair was done, at least they amply support the argument that properly performed repair operations are a most effective phophylaxis against cervical cancer.

It seems incredible and yet it is only too sadly true that often a physician is consulted by a patient who gives what would seem to be a typically suggestive history of discharge and bleeding and yet who is dismissed without examination, with merely a prescription for ergot, instructions for douching, and the advice to wait and see whether the condition does not clear up of itself. Perhaps the physician does not realize the significance of such a history, perhaps he is untrained or unequipped to make the necessary examinations, but whatever the cause, his tactics are more than futile, they are criminal. The equipment for a pelvic examination is simple, the cervix is readily accessible for inspection through a speculum, the development of a tactile sense is not difficult, and if the general physician does not feel himself competent to pass upon the case, he can always refer the patient to a specialist who is. No woman in the cancer years or before them, with such a history, should be dismissed without pelvic examination.

Moreover, mere palpation and mere inspection are not usually sufficient. Cancer in these modern days is not only a clinical

entity, it is a microscopic fact. The curette is the physician's weapon, the pathologist is his ally. Indeed, cancer cannot be treated without the pathologist, and a hospital which lacks that important member does not deserve its name. Serodiagnosis in cancer is still in its infancy and perhaps it will never outgrow its swaddling clothes, but diagnostic curettage and biopsy are established procedures, and the results of their interpretation by a competent pathologist may be taken as, humanly speaking, absolutely reliable. The patient may be inconvenienced, she may be put to needless expense, she may be unnecessarily alarmed, but on the other hand her life may be saved, and the end justifies the means. The curability of cancer depends entirely upon its early detection and early detection can be achieved only by adequate co-operation with the laboratory and the pathologist.

In this connection it is well to emphasize also the necessity for the routine examination of tissues excised when cervical repair is done. We have no guarantee that malignancy does not already exist, even in young women, and such a precaution is simply an added insurance against disaster.

The treatment of cancer is beyond the limits of my subject, but even at the risk of transcending them, let me point out that mere diagnosis is not enough. Treatment must be instituted promptly and it must be instituted discriminatingly. There is no type of treatment for all cases. Surgery is no more indicated as a routine than is irradiation, and there are instances in which, from the patient's standpoint, the best treatment is none at all, or, rather, to express it more clearly, the best treatment is one aimed to alleviate the symptoms rather than to cure the disease, for the reason that it is too late to treat the disease. The proper classification of cases is a sine qua non before any procedure is undertaken. The former devision of borderline cancer is no longer admitted to exist, and today we have only early and late cases, the early being those in which the disease is clearly localized within the cervix, the late, those in which it is extended beyond it. There may be subdivisions of this grouping and refinements of classification, but we cannot go beyond the fact that the type of treatment must always be decided by whether or not the disease is early or late, which in turn means whether or not is confined to the cervix or has extended beyond it.

As to the medical treatment of cancer, my own instinct, like yours, is to doubt the diagnosis in any supposed case in which a cure has been effected by drugs. As W. P. Mayo well puts it, the success of the cancer quack depends not upon the number of cancers he cures but upon the number of non-cancerous lesions he removes in the name of cancer. It would seem almost unnecessary to bid you flee from the advertised cancer cure as you would from the plague except that again and again one hears of physicians who, perhaps from ignorance, perhaps from other and less worthy motives, have apparently succumbed to its lure. In spite of its specious promises and its glowing testimonials, death stalks in its wake.

The situation is far from hopeless, at least as concerns cervical cancer. As Graves has pointed out, there are certain favorable factors in this disease which are not duly appreciated. It has a tangible etiology and a recognizable precancerous stage, it is primarily accessible, it is to a considerable extent preventable and in its early stages it is largely curable. The multiplication of statistics is unnecessary; we all know that the crux of the problem lies in two things, prevention and early detection. And both of these roads lead straight back to the medical profession, the achievement of both goals lies mainly in our hands.

We have already considered the importance of prompt diagnosis, we have already discussed the importance of the prompt correction of cervical lacerations and cer-

vical infections. They are always pathologic and they should never be tolerated, for while they may not become malignant, they have in themselves the possibilities of malignancy, so that every piece of prophylaxis, where they are concerned, cheats cancer of one potential victim.

But our responsibility lies deeper than our responsibility to our individual patients. We owe it to the public to keep constantly before it the true menace of cancer, and notable work has been done in this connection by the American Society for the Control of Cancer, the American Medical Association, the American College of Surgeons and the Gorgas Memorial Institute. But we have not gone far enough, we have not even approximated the results obtained in similar campaigns, notably that against tuberculosis. Cancer weeks are all very well but they are not enough. Systematic, intensive, unremitting preaching is necessary, precept upon precept, line upon line, repetition upon repetition. Nothing else can bring results.

And while we are preaching the menace of cancer, let us not ignore the other side. Let us emphasize to our patients and to the public that even in our present state of knowledge cancer is relatively a preventable disease, and that every case of cured cancer is fresh evidence that cancer can be cured. Cancer-hysteria is only a remote possibility, and I prefer Sir Berkeley Moynihan's view of the situation, that by preaching the menace of cancer to the public we are not scaring people to death, we are literally frightening them into life.

DISCUSSION.

Dr. C. P. Gray (Monroe): I am sorry that I was just a few minutes late, I was unavoidably detained, and I did not get here in time to hear all of the doctor's paper. I want to compliment him upon this paper, and, first of all to call to your attention the importance of the subject which the doctor has chosen.

I believe, in a way, there is no doubt but what the medical profession, from some angles, have frightened the public and misled the public, and have not educated them in the right direction, or, in other words, that we have spent a great deal of lost motion in trying to teach them and in educating them in the importance of the prevention of cancer.

I am only going to take two or three minutes of your time, because I would much rather hear Dr. Miller discuss this than for me to make any attempt.

Next, I believe that we have been at fault, as regards the cervix. We have been disposed to look upon the cervix simply as that portion of the uterus, the vaginal portion of the uterus which was capable only of creating damage to the extent of producing an extensive leukorrhea and in the majority of cases.

Now, it is true that we all know and realize that, to give grave consideration to the cervix that has been lacerated and torn in childbirth, and to advise that that be repaired as early as possible, in order to remove that scarred tissue or that source of irritation, in order to prevent cancer. Now, it seems to me, that that is just about as far as the medical profession, as a whole, has gone. It seems that we have forgotten to impress upon the public those little glands beyond the external or physical of the cervix, and the infection which becomes imbedded in those glands and produces, in the majority of cases, this so-called leukorrhea.

Now, it seems to me that in those cases that we have overlooked the fact to impress this woman or that woman that that very condition is likely to become cancerous, and, no doubt, in my opinion, a great many of those cases are pre-cancerous when we see them. I have been struck with what, to me, is an abhorrence of the incorrect treatment of these so-called cases of leukorrhea, simply for the reason that with proper treatment we might possibly destroy a latent cancer. A cancer which we do not recognize at that particular time.

I am sorry, Dr. Miller, that I did not hear all of your paper. I thank you.

Dr. E. D. Martin (New Orleans): To emphasize what Dr. Miller has said, that is, the importance of examining patients, not in any particular state, but at all times. I say this because I believe there are many members of this profession who are lax in such matters. Some of them live in districts where the women are too modest to permit an examination. It is surprising how often patients come to us, who if they had been examined before, or examined for some trouble of which they complain, they would have been relieved of a great many distressing symptoms.

I will report one case to show you how important it is to make these examinations, and I would

like to stress the importance of the rectal examination as well. Not more than a week ago a patient came to me with a diagnosis of hemorrhoids. On examining the vagina I found a large tumor. This proved to be a fecal pack; this was removed and all her symptoms disappeared. It was fortunate for her that this occurred, because she had an eroded cervix which looked angry, and, although not malignant, might, I believe, in time have become so.

The younger men are being taught to examine their patients, but the older men in the profession are lax, and they are not only lax in the examinations but they are lax in not insisting on these examinations as routine.

Dr. Jabez N. Jackson (Kansas City, Mo.): I am not what is known as a gynecologist, although in our particular part of the country the general surgeon does gynecology as well.

I heard most of Dr. Miller's paper, enough to get the trend of his opinion, which I approve of absolutely. In all the years that have gone in the much investigated subject of cancer it is surprising how little we know about cancer today, and, yet, in another sense it is surprising how important are the things we do know, if we would put them into working effect.

We know very little as to the real nature and origin of cancer, some have believed in the specificity of it, due, possibly, to bacterial origin of it, others do not. I belong to the latter group, I do not believe there is any specific infection in dealing with cancer, but we all have learned certain things, that is, that cancer can be produced by certain things, and those things can be classified under one thing, that is, chronic, repeated irritation, whatever it may be.

Sometimes this chronic irritation may be bacteriological in type, sometimes mechanical, sometimes thermal in type, but old lesions, neglected, can be the site in which cancer will develop, the result is the argument which Dr. Miller has produced for the repair of the cervix and the correction of old cervical cases, the only logical thing we know for prevention.

The second thing of importance is that every cancer, to begin with, is purely a local disease. Here is the correlary: that, if recognized when purely local and eradicated, nobody would die of cancer. Therefore, comes the great necessity of educating, not only the doctors who have the patients to examine, but in arousing the conscience of a woman to submit herself to examination whenever she finds anything in the nature of an irregular discharge of whatever type.

Setting about what I expect to talk to you this afternoon. In my early days of cancer of the breast, I never saw a woman with cancer until the diagnosis was so evident that a housemaid might have made the examination. Now-a-days I find that in at least fifty percent of the women who come to me for tumor of the breast, a clinical diagnosis is impossible, and the result is that we are getting our patient at a time when the possibility of surgery is being vastly improved.

It matters not what we may consider as the therapeutics of late diseases, in most cases hopeless, although I am frank to say this, that, from observations, in the last few years, I have been very much encouraged to realize that there are some types of carcinoma of the cervix which used to be hopeless, but are now giving promising results from the use of radium. I still believe, however, that if the disease can be recognized in the very earliest state, where we know the pathology is confined entirely within the uterine body there is nothing so logical as the complete surgical removal of the uterus at that time. The difficulty comes in enabling us to determine as to whether there may be lymphatic permeation beyond the line.

When one comes with the infiltration of the uterus, backaches, severe in type, we realize that patient has passed the period for surgery, and it is a question of whether we can accomplish it by such a thing as radiation.

In the early days, I was somewhat skeptical of the benefit of radium, I am speaking of radium because I think that is the only thing to consider in the treatment of cervical carcinoma. In the radium you can put your application right where you want it, and in the last few years I have seen several cases apparently inoperable that have been submitted to the radium with apparent clinical cure, some of them running over enough years to make it encouraging but, fundamentally, I think it is a most important thing for us to teach ourselves and to teach our patients that any disturbances of any unusual type in the woman, particularly when she reaches that period of susceptibility, that is about forty, that every unusual symptom should be carefully noted, that a doubtful diagnosis should be made a clear diagnosis by curetage and examination of the specimen, and these pre-cancerous lesions should be removed before they become cancer, and the cancer should be attended to in the early stages, where it is curable.

Dr. J. A. Devron (New Orleans): There is one thing I want to comment on. Most of you gentlemen have been approached by the radium interests. They are going around telling the doctors that if you buy radium it will cure cancer and everything else. That is a great danger. I think we should warn the general practitioner that it is

dangerous. Radium must be applied scientifically, and even men who have been using it for years will tell you that at first they did not know how to apply it and not destroy too much tissue. Sometimes, in the past, we have had the uterus and even the bladder slough down on us when we did not know how to use it. How can the general practitioner play with such a weapon? I think we should tell the general practitioner not to listen to these radium salesmen, but if they buy radium before applying to consult a gynecologist, or a specialist who will tell them how to apply it correctly.

Dr. C. Jeff Miller (New Orleans) (closing): The purpose of my paper was to emphasize the prophylaxis of cancer, not its treatment, and, in particular, to call attention to chronic infections of the genital tract as possible sources of malignancy. The cervix is the most common site of malignancy of the genital tract, a fact that is self-explanatory if we accept the theory of chronic irritation as the chief causative factor in the disease. Lacerations of the cervix occur in some degree in every delivery. All of them do not require surgical repair, indeed, the majority of them heal spontaneously. But those which do not, if they are neglected, produce definite and annoying symptoms, chief of which is the leukorrhea which is the most frequent reason for gynecologic consultation. Many physicians, I know, still advise against prompt repair of the cervix, even in those lacerations which quite evidently demand surgical treatment, on the ground that the woman will probably have more children and the work will be undone. This is bad advice. Every diseased cervix which gives rise to symptoms demands treatment, and whether that treatment is or is not surgical is beside the point. The principle is that some treatment is indicated, the details are matters to be settled by a study of the individual case.

Moreover, promptness of treatment is quite as essential as the procedure itself. In our present knowledge of cancer, imperfect though it be, we at least know that it is a disease whose origins may be traced many years back. To permit a lacerated and diseased cervix to remain untreated for years is therefore simply an invitation to malignancy to establish itself in the tissues. Correction of these troubles at or after the menopause is a policy which has nothing to commend it. If the condition is handled promptly the treatment is frequently a very simple matter, for cauterization with the electro-cautery, which is a feasible office procedure, is sufficient for the majority of cases.

Graves has emphasized very strongly the part which defective drainage may play in the development of malignancy, and it is easy to see how stenosis of the cervix or a contraction of the vagina may give rise to chronic irritation. Likewise fibroids play a part in the production of this condition, not in the production of cervical carcinoma but of fundal carcinoma. Histological considerations prevent the development of malignancy in the growth itself, but the presence of fibroids within the uterus means another source of chronic irritation, and a very large number of cases of fundal malignancy are found to be associated with uterine fibroids.

Until we know more about the actual cause of cancer, we must labor persistently in the field of prophylaxis, and there is no doubt that both the incidence of the disease and its frightful mortality can be materially reduced by prompt and systematic treatment of lacerated and infected cervices.

BLASTOMYCOSIS*

ALDO CASTELLANI, M. D.,†

NEW ORLEANS.

For some years I have been interested in the investigation of diseases caused by yeast-like or budding fungi. The term blastomycosis *sensu lato* covers all these conditions, although from a practical point of view it could be of advantage to limit the meaning of the term blastomycosis to denote solely or principally a clinical entity or more correctly a group of closely allied entities characterized by the presence of granulomatous, verrucoid lesions in which fungi of the type blastomycoides are found.

Yeast-like Fungi.—The term "yeast-like fungi" or "budding fungi" is unscientific, but useful in practice. "Yeast-like fungi" are fungi which in the lesions appear as free oval or roundish cells, some of them budding, with usually no mycelium at all, exceptionally a few mycelial elements. In cultures there my be only budding cells, or budding cells and mycelium or mycelium only. Morphologically, in the lesions two principal types of yeast-like fungi may be distinguished (a) the blastomycetoid (blas-

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tomycetic type, (b) the cryptococcoid (saccharomycetic) type.

The characters of the blastomycetoid type are the following: Cells large, double contour very well marked, granules or spherules in the protoplasm very evident and of comparatively large dimensions.

The characters of the cryptococcoid (or saccharomycetic) type, are the following: Cells generally smaller, double contour absent or much less marked, protoplasmatic granules not so evident and usually much finer.

These fungi belong to widely different botanical groups; when cultivated, some of them show the same morphological characters as in the lesions, viz., oval or roundish budding cells, with no mycelium, but quite a number of them show presence of mycelium, and some, in fact, mycelium only.

Classification of Yeast-like Fungi (Budding Fungi).—The late Dr. Chalmers and myself have given a botanical classification of these organisms in the third edition of our "Manual or Tropical Medicine." Some of them are ascomycetes, others are fungi imperfecti; the principal families to which they belong are the following:

(a) In cultures, budding cells, and in addition asci and ascospores present, no mycelium — Family Saccharomycetaceae, Rees, 1870.

(b) Same as (a), but mycelium present—Family Endomycetaceae, Rees.

(c) In cultures, budding cells (blastospores) present, no asci and no mycelium —Family Cryptococcaceae, Kützing, 1833.

(d Same as (c), but mycelium present —Family Ooosporaceae, Saccardo.

Each family contains a number of genera, a brief description of which may be found in Castellani and Chalmers' "Manual or Tropical Medicine", and also in the Gehrmann Lectures, University of Illinois, 1926 (Fungi and Fungous Diseases, by Castellani).

The following genera concern us—*Blastomycoides, Cryptococcus, Saccharomyces, Debaryomyces, Monilia, Willia.*

GENUS BLASTOMYCOIDES CASTELLANI, 1926.

Synonyms. — Blastomyces; Oidium pro parte; Crytococcus pro parte; Coccidioides pro parte; Zymonema pro parte.

Remarks.—As unfortunately, for botanical reasons, the generic term Blastomyces can not stand, I suggested recently the creation of a new genus, Blastomycoides, which should be placed in the Family Oosporaceae rather than in the Family Cryptococcaceae.

Definition.—The genus Blastomycoides Castellani may be defined as follows: "Oosporaceae, with abundant mycelium and aerial hyphae when grown on glucose agar; abundant mycelium with, at times, lateral conidia when grown in glucose broth hanging drops; no gas fermentation of any sugar. In the lesions, only roundish or oval large cells are seen, at times, budding, with well-defined double contour and well-marked granulations in the plasma present, without any mycelium." This genus, in all probability, contains a number of species, but for the time being the following may be differentiated: *Blastomycoides dermatitidis, Blastomycoides immitis, Blastomycoides tulanensis.* For the practical differentiation of these three types I have found useful to grow the fungi on mannitol agar (1 per cent) and on lactose agar (1 per cent), besides other media. The agar is made up with peptone water, not broth. Large tubes should be used, not the ordinary tubes used for bacterial cultures. The inoculated tubes are kept at 26° C. for two weeks and then examined. In a fairly warm climate like New Orleans keeping the tubes at the temperature of the room is satisfactory.

Blastomycoides dermatitis Gilchrist and Stokes, 1898 *emen.* Castellani. — *Syn-*

onyms: Blastomyces dermatitis, Gilchrist and Stokes, 1898; *Oidium dermatitis* Ricketts; *Cryptococcus gilchristi* Vuillemin; *Zymonema gilchristi* de Beurmann and Gougerot; *Mycoderma gilchristi* Jannin, 1913.

In the lesions large roundish spore-like cells are found, 10 to 16 microns and much more, with a well-marked double contour and well marked protoplasmatic granules. On glucose agar the growth is white or greyish and often fluffy; abundant mycelium is present; several tufts of longer aerial hyphae are often seen in the centre. In mannitol agar (1 per cent) the growth is white-greyish with often a peculiar woolly surface. After a time (2 to 3 weeks) there may be a darkening of the growth and of the medium. In glycerine agar (1 per cent.) the growth is white, fluffy. On potato the growth is abundant, with white duvet. In glucose broth and other sugar broths the growth takes place all over the medium, including the surface portion. In glucose broth and peptone water hanging drops made from glucose agar cultures, at times only mycelial threads are seen, with absence of only very scanty lateral conidia; if these are present they seem to be mostly sessile. Gelatine is not liquefied. No gas fermentation of any sugar.

Blastomycoides immitis Rixford and Gilchrist, 1897. — *Syncnyms.* — *Coccidioides pyogenes* Rixford and Gilchrist, 1896; *Oidium coccidioides* Ophüls, 1905; *Oidium protozoides* Ophüls, 1905; *Posadasia esferiformis* Canton, 1898; *Oidium immite* Verdun, 1907; *Oidium pyogenes* Verdun, 1906; *Mycoderma immitis* Brumpt, 1925.

Remarks.—For this fungus the genus Coccidioides was created by Rixford and Gilchrist in 1897. The principal characteristic would be the presence of very large asci with numerous ascospores. The botanical investigation I have carried out on two strains of this fungus did not show the presence of true ascospores. The numerous minute bodies described as ascospores inside the large round cells are not in my opinion ascospores; they are protoplasmatic granules or spherules. My contention seems to be proved by the fact that when one of the large roundish cells produces a bud which later becomes a mycelial filament the same minute bodies are seen in the bud and in the mycelium so produced. I venture to state therefore, that for the present at least this fungus should not be considered to belong to the ascomycetes but to the fungi imperfecti and being very similar to blastomycoides dermatitis should be placed in the same genus, viz., in the genus blastomycoides.

Characters of the Fungus in the Lesions and in Cultures.—In the lesions large roundish or oval spore-like bodies are seen, 10 to 20 microns and even much larger. They have a well defined double contour and numerous minute roundish bodies are seen in the protoplasma which I am inclined to consider to be protoplasmatic granules or spherules. On mannitol agar 1 per cent after two weeks incubation at 26° but as a general rule also after the same period of incubation at 22° or at the room temperature the growth becomes of a black slate colour and most of the medium takes the same colour. On glycerol agar the growth is white-greyish with a fluffy surface with a somewhat woolly appearance. On lactose agar the growth is whitish or greyish, there is no evident darkening of the medium. On potato it is usually white and fluffy. On carrot it is also white and fluffy. In glucose broth the fungus growth is both at the surface and bottom. In hanging drop cultures a large amount of mycelial threads are seen, lateral conidia supported by sterigmata are often absent or present only in small numbers.

Blastomycoides tulanensis Castellani, 1926.—In the lesions large roundish or oval cells are found, 8 to 16 microns and even much larger with well-marked double contour and some granules or spherules in the protoplasma of fairly large size. On glucose agar the growth is white and somewhat fluffy, this being due to tufts of aerial hyphae. In mannitol agar the growth is white and the medium does not become darkened. On lactose agar the growth is white, there is no darkening of the medium. In glycerol agar the growth is at times nodular with slight white duvet, at times fluffy white. In peptone water or glucose-peptone water or glucose broth hanging-drop cultures made from glucose agar cultures round lateral conidia supported by well-developed sterigmata are usually present. In cultures on solid media especially in the submerged portion of the growth at times large round or oval cells with a well-marked double contour membrane and protoplasmatic granulations may be present very similar or identical to those found in the lesions.

Blastomycoides tulanensis on glucose agar and several other media often grows like a trichophyton with white duvet and at times radiating furrows.

In the following table are collected some differential cultural characters of the three types of blastomycoides. On glucose agar the differences are slight or absent, but they are usually distinct on mannitol, lactose and glycerol agars. The tubes were kept at 26° C. for three weeks.

	Glucose Agar	Mannitol Agar	Lactose Agar	Glycerol Agar
B. immitis	Whitish-greyish or light fawn.	Growth and medium slate black colour.	White or greyish.	Greyish, woolly appearance.
B. dermatitis	Whitish or greyish, fluffy.	Greyish wth often woolly appearance; at times deep darkening of the growth and medium.	Dark grey, at times almost slate black with darkening of medium.	White, fluffy.
B. tulanensis	White, fluffy.	Always white, no darkening of medium.	White, medium not darkened.	At times fluffy, at times nodular with short white duvet.

GENUS CRYPTOCOCCUS KUTZING, 1833.

Definition.—Cryptococcaceae (budding fungi not forming ascospores) with vegetative elements not elongate; roundish or oval, with no very distinct double contour although there are exceptions; pathogenic and non-pathogenic; no globule of fat and only one bud at a time, and no formation of thick pellicle on fluid sugar media. Can be cultivated, the cultures consisting solely of roundish or oval cells with no mycelial filaments. Some species gas-ferment glucose and other sugars.

Principal Species.—For reasons already stated, and principally owing to the presence of a large amount of mycelium in cultures, the fungi described by Gilchrist in blastomycosis — *Cryptococcus* (*Blastomyces*) *dermatitis*—cannot be placed in this genus, as has often been done by some observers. The fungus found by Busse in a case of multiple abscesses and some fungi found by me in certain cases of blastomycosis of the tongue and in blastomycosis furunculosa may be placed in this genus.

Cryptococcus hominis Vuillemin 1901. — *Synonyms.* — *Saccharomyces* (sp.?) Busse, 1894; *Atelosaccharomyces bussebuschki* (Beurmann and Gougerot, 1909).

This organism was found in multiple deep abscesses in a woman by Busse. In the pus the fungus was present in the shape of oval bodies, with a membrane which had a double contour. These elements were arranged in groups; each group was embedded in an amorphous substance and surrounded by a capsule. Culturally the fungus showed only roundish budding forms, no mycelium and no

asci. Growth on solid mediums was generally white with at times a yellowish tinge. Gelatine was not liquefied. According to Sasagawa, this fungus produces acidity in glucose, levulose, mannitol and galactose. The organism was pathogenic to rabbits, white mice and dogs.

Cryptococcus (Monilia) macroglossiae Castellani, 1925.—In Ceylon during the period 1903-1915 I observed three cases of a peculiar type of macroglossia of blastomycetic origin. Two years ago an interesting case of macroglossia of the same type was referred to me in London by Dr. Broughton Alcock, and in this case, too, I isolated a yeast-like organism.

Description of the Organism.—It is a yeast-like fungus, gram-positive and not acid-fast. The individual cells are oval and of rather large dimensions, the maximum diameter varying between 4 and 5 microns.

Cultural and Biochemical Characters.—On dextrose agar there is abundant growth, white, with a smooth surface. On ordinary agar there are the same characters as on dextrose agar, but they are less abundant. Glycerin and serum are not liquefied.

Sugar Peptone Water.—The organism does not produce gas in any sugar or other carbohydrate. Rarely it may produce a slight amount of acidity in dextrose.

Litmus Milk.—In litmus milk there is no change.

Agglutination.—It is agglutinated by the patient's blood (1 in 400); not agglutinated, or only slightly so, by the blood of patients suffering from furunculosis blastomycetica.

Presence of Asci and Mycelium—Asci have never been observed even in very old cultures; a little mycelium is not rarely visible in certain cultures, especially in fluid mediums. It would, therefore, probably be more correct to place this fungus in the genus *Monilia*, instead of the genus *Cryptococcus*. If it is placed in the genus *Monilia* it belongs to the *zeylanica* type (absence of gas in every sugar); it differs from *Monilia zeylanica* in not producing pigment, the cultures of *Monilia zeylanica* being yellow. The correct name for the organism would be *Monilia macroglossiae* Castellani (synonym, *Cryptococcus macroglossiae* Castellani).

Remarks on Macroglossia Blastomycetica.—The whole tongue is greatly enlarged, occasionally painful; the patient feels discomfort in eating and may have some difficulty in speaking; he cannot whistle. It may be difficult to make the clinical diagnosis of blastomycetic macroglossia, as the tongue, though greatly enlarged, may show almost complete absence of the verrucoid patches so typical of blastomycosis. Deep scrapings should be made from the tongue after it is dried and painted with tincture of iodine, and cultures should be made. The observation of yeast-like organisms in superficial scrapings of the tongue is without importance, as these fungi are not rarely found in that situation even in normal mouths. Potassium iodide has a beneficial effect on the condition. Vaccines prepared with the fungus seem to be useful.

Cryptococcus castellanii Re, 1925.—*Synonym. — Monilia* (Sp.?) *Castellani*, 1924; *Monilia castellanii* Re, 1925. Isolated by me from peculiar cases of persistent furunculosis, not answering to staphylococcus vaccine (blastomycosis furunculosa, furunculosis blastomycetica).

Description of the Fungus (English cases).—Morphologically the organism is yeast-like, gram-positive and not acid-fast. The individual cells are somewhat rounded or oval. The maximum diameter of most cells is from 3 to 4 microns. The fungus is seldom detected microscopically in the pus of the boil-like lesions, staphypococci generally being present in large numbers;

cultural methods are necessary; the cultures from the pus, as a rule, resemble cultures of staphylococcus aureus. It may be necessary to make a dozen or more preparations from what looks like a pure staphylococcus growth to find a few yeast-like cells. By plating and replating on dextrose agar mediums the fungus is finally isolated.

Cultural and Biochemical Characters.—The fungus grows abundantly on dextrose agar and grows also well, though less abundantly, on ordinary agar. The cultures on dextrose agar are at first white, but after a few days they show a characteristic yellowish or yellowish brownish pigmentation with occasionally a purplish or reddish tinge. Gelatin and serum are not liquefied.

Lead agar is not darkened during the first two weeks; later a slight darkening may occasionally take place.

Sugar Peptone Waters.—The fungus when recently isolated has little or no fermentative action on any sugar; it may produce a slight acidity in dextrose and levulose, and occasionally a slight amount of gas. When the fungus has been transplanted several times its fermentative action is greatly increased, and it generally produces acid and gas in dextrose and levulose and occasionally slight acidity in galactose; it does not form gas in any other sugars.

Litmus Milk.—The medium is not clotted; a slight acidity may be present.

Agglutination.—The fungus is agglutinated by the patient's blood in certain cases up to 1 in 400.

Ascospores and Mycelium.—I have never never found asci even in extremely old cultures; mycelium in small amount is not rarely present in certain mediums, especially fluid mediums. A more complete description may be found in the Journal of Tropical Medicine and Hygiene, June 15, 1925.

Cryptococcus farciminosus Rivolta and Miscellone, 1883. *Synonyms:—Cryptococcus tokishigei* Vuillemin; *Lymphosporidium equi* Gasperini, 1908; *Leukocytozoon piroplasmoides* Ducloux, 1908.

Definition. — Vegetable oils *in situ*, oval or roundish, with well marked double contour.

Remarks.—This organism is often included in hypertrophied endothelial cells and in leukocytes in the lesions in horses suffering from lymphangitis epizootica in Europe, Africa, Asia and America.

Cultivation.—It is difficult to cultivate. Nègre and Boquet have used with success a medium made of agar and dried horse dung. Sugar reactions are unknown.

Cryptococcus epidermis Castellani, 1914.—Found by me in saccharomycosis or cryptococcosis epidermica; cells of variable size; has not yet been cultivated.

Cryptococcus capsulatus Darling, 1906. *Synonym.—Histoplasma capsulatum* Darling, 1906.

Definition.—In the affected tissue the parasite appears in round or oval form, measuring from 1 to 4 microns in diameter and enclosed in an achromatic refractile capsule. Cultivation so far has been negative.

Remarks.—This organism was found by Darling in the endothelial cells of capillaries and small blood vessels in the lungs, spleen, liver, intestines and lymph glands, as well as in the leukocytes. It was considered by Darling and others to be a protozoon, and for it the genus histoplasma was created. At present there is a consensus of opinion that it is a cryptococcus.

Pathogenicity.—This fungus is pathogenic for man, causing disseminated, hyaline, pseudogranulomas in the lungs, splenomegaly, necrotic areas in the liver and ulceration of the small and large intestines.

Cryptococcus histolyticus Stoddard and Cutler, 1916.—*Synonym:—Torula histolytica* Stoddard and Cutler. Found in a case of mycotic cerebrospinal meningitis (Freeman and Weidman); cultures yellowish. Produces acidity in glucose, maltose, saccharose and dextrine.

Cryptococcus ruber Demne, 1889.—*Synonym:—Saccharomyces ruber* Demne, 1889.

This organism was found in the stools of children suffering from enteritis and also in certain specimens of milk.

It grows easily on ordinary laboratory mediums, producing red colonies. According to Casagrandi, it does not ferment any sugar.

Crytococcus pararoseus Castellani, 1926.—Isolated by me from the sputum of patients in the tropics with chronic bronchitis. Grows well on all ordinary mediums. The growth has a smooth surface and is pink or pink-red. It produces slight acidity in glucose and levulose.

Cryptococcus metaniger Castellani, 1926.—Isolated by me from a peculiar variety of Trichomycosis nigra. The cells are rather elongated, and it is posible that further investigation will show that the fungus does not belong to the genus Cryptococcus. On glucose agar it produces a jet black growth. It differs from C. niger Vuillemin in that the cells are more elongated and that the cultures are black in all the ordinary laboratory mediums. C. niger Vuillemin was originally found by Muffucci and Sirleo in 1895 from a pulmonary myxoma of a guinea-pig. The cells *in situ* have a thick mucilaginous membrane. The growth was brown or black on potato, but white on most other mediums.

Cryptococcus graciloides Castellani, 1925.—Isolated by me from cases of stomatitis cryptococcobacillaris in Central America. It is generally found living in symbiosis with *Bacillus vermiculoides* Castellani, 1925, from which it may be separated with difficulty.

This cryptococcus is a delicate yeast-like organism, gram-positive and not acid-fast. Each cell is roundish or more often oval, with frequently a flask-like shape. In preparations from the cultures the average maximum longitudinal diameter of most cells is from 3 to 4.5 microns, and the maximum average transverse diameter is from 2 to 3 microns.

Cultural and Biochemical Characters.—On dextrose agar, minute colonies somewhat streptococcus-like appear. On McConkey lactose agar there are minute colonies, but growth is often more abundant than on dextrose agar. In gelatin and serum growth is exceedingly scanty, and neither of the mediums is liquefied. With lead agar there is no evident darkening of the medium.

Sugar Peptone Waters.—There is no fermentation of any sugar, but it must be noted that the fungus grows scantily in these mediums and that sometimes there is no growth.

There are many other species of less known cryptococci. The following may be mentioned, none of which has been completely investigated biochemically.

Cryptococcus linguae-pilosae Lucet, 1901.

Cryptococcus plimmeri Constantin, 1901.

Cryptococcus degenerans Vuillemin, 1896.

Cryptococcus corselli Neveu-Lemaire, 1908.

Cryptococcus breweri Verdun, 1912.

Cryptococcus tonkini Legendre, 1911.

Cryptococcus sulfureus Beauverie and Lesieur, 1912.

Cryptococcus lesieuri Beauverie and Lesieur, 1912.

Cryptococcus salmoneus Sartory, 1911.

Cryptococcus niger Vuillemin.

Cryptococcus guillemondi Beauverie and Lesieur, 1912.

Cryptococcus harteri Beurmann and Gougerot, 1913.

Cryptococcus hudelo Beurmann and Gougerot, 1914.

Crytococcus membranogenes Steinhouse, 1916.

GENUS SACCHAROMYCES MEYEN, 1838.

Definition. — Saccharomycetaceae (viz. budding fungi producing ascospores) with smooth spores, spore membrane single; no evidence of any copulative process; occasionally rudimentary mycelial tubes present; with transverse septation; induce alcoholic fermentation.

Saccharomyces blanchardi Guiart, 1906. —Found at an operation by Blanchard, Schwartz and J. Binot, on a patient who had been considered to be suffering from tubercular peritonitis. The fungus had produced in the peritoneum a large whitish, gelatiniform mass, weighing about 1 kg. The fungus grew well on all sugar mediums.

On maltose agar it produced crateriform colonies of snow-white color; asci with eight spores were present. On gelatin the growth was mucoid-like and gray. Liquefaction of the medium was slow. On potato there was a mucoid growth, whitish and darkening after a long time. On carrot the growth was viscid and abundant; it was pathogenic to rabbits, in which it induced a general mycosis, which terminated fatally.

Saccharomyces granulatus Vuillemin and Legrain, 1900.—Observed by Vuillemin and Legrain in a tumor of the submaxillary bone; cells ovoid, from 4 to 5 microns in length, and from 3 to 4 microns in breadth; cultures pinkish or pinkish red; ascospores and chlamydospores present; gelatin not liquefied, sugar reactions not given.

Saccharomyces tumefaciens Curtis, 1896. *Synonym.* — *Saccharomyces subcutaneus tumefaciens* Curtis, 1896. Found by Curtis in a myxomatous tumor. It appeared in the tissues in the shape of spherical bodies from 16 to 20 microns in diameter, each surrounded by a zone of amorphous substance; grows well on all sugar mediums; in old cultures asci are seen, with from one to four spores; gelatin with surface growth whitish, no liquefaction; said to ferment saccharose, but not maltose or lactose; action on dextrose not mentioned; pathogenic to rats and dogs.

Saccharomyces samboni Castellani, 1907. —Cells roundish, from 6 to 8 microns in diameter, easily grown on various mediums, producing white colonies, which rapidly coalesce; found by me in Ceylon in a few cases of intertriginous dermatitis of the cruroscrotal region. A similar or identical organism has been observed by Whitfield in England in a case of the same dermatitis. Ferments glucose, levulose and maltose; gelatin is not liquefield; in old cultures asci are occasionally present, but certain strains do not seem capable of producing asci and therefore probably belong to the genus cryptococcus.

Saccharomyces hominis Klein and Gordon, 1903.—Isolated in some cases of tonsillitis clinically resembling diphtheria; roundish or oval cells, from 5 to 7 microns in diameter; pathogenic to guinea-pigs and rabbits; sugar reactions unknown.

Saccharomyces anginae Achalme and Troisier, 1895.—Found by Achalme and Troisier in a case of tonsillitis showing white patches; *in situ* cells ovoid, from 8 to 15 to 5 to 6 microns; in cultures 4-spore asci are present; on gelatin, surface growth white; ferments saccharose, but other reactions not given.

Saccharomyces balzeri Balzer, Burnier and Gougerot, 1911.—*Synonym.*—*Parendomyces balzeri* Balzer, Burnier and Gougerot, 1911. Grows on culture mediums under the type of oval or roundish, yeast-like cells, proliferating by budding; isolated by Balzer, Burnier and Gougerot

from a gummatous condition; sugar reactions unknown.

Saccharomyces cerevisiae Meyen, emendavit Hansen.—*Synonym:* — *Cryptococcus fermentum* Kützing; *Tortula cerevisiae* Turpin; *Hormiscum cerevisiae* Bail.

Cells oval or roundish, ascospores formed at all temperatures between 12 and 37 C., optimum from 25 to 30 C.; abundant growth on all ordinary laboratory mediums, colonies, white, surface usually smooth. There are several varieties of S. cerevisiae. The one in my collection gas ferments dextrose, levulose, maltose, galactose and saccharose. This fungus and its varieties are used in the production of beer.

Saccharomyces ellipsoideus Hansen.—Vegetative cells, mostly elliptical; optimum temperature for appearance of ascospores 25° C., ascospores-formation takes place at any temperature between 10° and 32° C. The ascus cell is of small dimensions, is ellipsoidal and contains from one to four ascospores which measure from 2 to 5 microns; according to Marchand, they germinate after having copulated two by two. This saccharomyces which is found on the surface of grapes plays an importtant role in the process of vinification.

Saccharomyces pastorianus Hansen.—Vegetative cells roundish or oval, at times elongated; asci elongated, usually containing from 1 to 4 ascospores, each ascospore varies in size between 1.5 and 3.5 microns; occasionally much larger ascospores may be seen, up to 5 microns in diameter; optimum temperature for development of ascospores 27.5° C., but ascospore formation takes place at any temperature between 4 and 30.5° C.; at 31.5° C. formation of ascospores ceases completely. This fungus gives a bitter taste and a bad odor to beer.

GENUS DEBARYOMYCES KLOCHER.

Definition.—Saccharomycetaceae with ascospores presenting a verucose surface. Several yeastlike organisms, some of which are found in scrapings from the skin and are probably non-pathogenic, have been classified in this genus of Ota. A pathogenic one is *Debaryomyces hudelci* (de Beurmann and Gougerot, (1909), Fonseca emendavit 1922. Asci, which are scanty, contain one spore with a cerrucose surface. The fungus is said to ferment glucose and saccharose, but not levulose, maltose, galactose or lactose. It was found by Hudelo, Rubens, Duval and Laederich in a case of multiple abscess in France (Busse-Buschke type of blastomycosis). The vegetative cells are roundish or oval, occasionally elongated. They are from 2 to 4 microns, in diameter, and when elongated from 6 to 8 microns.

GENUS WILLIA HANSEN, 1904.

Definition.—Saccharomycetaceae with ascospores lemon-shaped or hat-shaped; as a rule they do not produce alcoholic fermentation, but do produce various ethers; cultures present a pleasant fruity odor.

Species in Man.—*Willia anomala* Hansen, 1904.

Willia anomala Hansen, 1904.—Rather small oval cells; in sugar liquid mediums it forms a well marked membrane, containing air bubbles; asci with from two to four spores of the so-called hat-like type; dextrose fermented, but not saccharose or maltose; ferments beer-wort, with production of ethers; found by Beauverie and Lessieur in the sputum of a tuberculous patient.

GENUS MONILIA PERSOON, 1797.

As regards the botanical characters of the genus *Monilia*, the original definition by Persoon is *Stipitata aut effusa byssoidea, Fila moniliformis articulata.* These fungi are stated to be characterized by the sporophores being simple or subsimple, and producing by constriction at their extremities, a chain of large, lemon-shaped conidia, often provided with a disjunction apparatus. The general tendency at the present time, however, is to extend the term *"Monilia"* so as to include all those organisms of the family Oosporaceae Saccardo, 1886, the vegetative body of which (thallus) in its parasitic life

(*in situ* in the lesions) appears composed of mycelial threads and free budding forms, some of the mycelial filaments being long and branched, and of rather a large size, and often presenting arthrospores. In the saprophytic life (cultures on the usual solid laboratory media mostly yeast-like, roundish or oval bodies are seen, while mycelial filaments are very scarce or absent, and when present they are rather short and consist only of a few articles. Some monilias show very little mycelium also in the lesions. Monilia fungi very often ferment glucose and other carbohydrates with the production of gas.

Classification. — Morphologically, monilias may be separated into two groups: (1) the free budding cells are roundish, and (2) the free budding cells are oval or elongated. Morphological characters, however, will not help further in the classification of these fungi, and for some years I have recommended a biochemical classification. For practical purposes monilias may be conveniently classified according to some of their biochemical characters, as follows:

1. Gas produced in dextrose only. *Balcanica* Group.—Principal species: *Monilia balcanica,* Castellani; *Monilia parabalcanica,* Castellani.

2. Gas produced in dextrose and levulose. *Krusei* Group.—Principal species: *Monilia krusei,* Castellani; *Monilia parakrusei;* of *Monilia krusei* there are apparently two types morphologically: one oval (typical *krusei*), the other roundish; *Monilia castellanii* Re., is probably a cryptococcus.

3. Gas produced in dextrose, levulose and maltose. *Pinoyi* Group. — Principal species: *Monilia pinoyi* Castellani; *Monilia nabarroi* Castellani.

4. Gas produced in dextrose, levulose, maltose and galactose. *Metalondinensis* Group.—Principal species: *Monilia metalondinensis* Castellani; *Monilia pseudometalondinensis* Castellani.

5. Gas produced in dextrose, levulose, maltose, galactose, and saccharose. *Tropicalis* Group.—Principal species: *Monilia tropicalis* Castellani; *Monilia metatropicalis* Castellani.

6. Gas produced in dextrose, levulose, galactose and saccharose. *Rhoi* Group.—Principal species: *Monilia rhoi* Castellani.

7. Gas produced in dextrose, levulose, maltose and saccharose. *Bronchialis* Group.—Principal species: *Monilia bronchialis.*

8. Gas produced in dextrose, levulose, saccharose and raffinose. *Guillermondi* Group.—Principle species: *Monilia guillermondi* Castellani; *Monilia pseudoguillermondi* Castellani.

9. Gas produced in dextrose, levulose, galactose, saccharose and insulin. *Macedoniensis* Group.—Principal species: *Monilia macedoniensis* Castellani; *Monilia macedoniensoides* Castellani; *Monilia chalmersi* Castellani.

10. Gas produced in lactose and other carbohydrates. *Pseudotropicalis* Group.—Principal species: *Monilia pseudotropicalis* Castellani, of which there are several varieties.

11. Gas produced in dextrin, in addition to other carbohydrates, but not in lactose. *Pseudolondinensis* Group. — Principal species: *Monilia pseudolondinensis* Castellani; *Monilia pseudolondinoides* Castellani; *Monilia africana* Macfie.

12. No gas produced in any sugar. *Zeylanica* Group.—Principal species: *Monilia zeylanica* Castellani; *Monilia zeylanoides* Castellani; *Monilia macroglossiae* Castellani.

It is important to note that many monilias after a few transplantations lose some of their fermentative characters or these are altered. Hence, the determination of species is possible only when recently isolated strains are used. There are, however, certain monilias, as, for instance, *M.*

TABLE I.

BIOCHEMICAL CHARACTERS OF CERTAIN MONILIAS.

	Glucose	Levulose	Maltose	Galactose	Saccharose	Lactose	Mannitol	Dulcitol	Dextrin	Raffinose	Arabinose	Adonitol	Inulin	Sorbitol	Starch	Glycerine	Inositol	Salicin	Amygdalin	Isodulcitol	Erythrite	Gelatine	Serum	Litmus Milk		REMARKS
Monilia zeylanica Castellani	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	C	Yellowish	
Monilia zeylanoides Castellani	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	Produces no discoloration of lead agar.
Monilia (cryptococcus) macrogiossiae Castellani	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	Produces black discoloration of lead-agar.
Monilia balcanica Castellani	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia parabalcanica Castellani	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	C	White	
Monilia krusei Castellani	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia parakrusei Castellani	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	C	White	
Monila (cryptococcus) castellanii Re	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	Yellowish or reddish-brownish	This fungus is probably a true cryptococcus. The peculiar reddish-brownish colour is best seen in old potato cultures.
Monilia pinoyi Castellani	G	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia nabarroi Castellani	G	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	C	White	
Monilia metalondinensis Castellani	G	G	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia pseudolondinensis Castellani	G	G	G	G	O	O	O	O	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia alba Castellani	G	G	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	C	White	
Monilia pseudolondinoides Castellani	G	G	G	G	O	O	O	O	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	C	White	
Monilia africana Macfie, 1921	G	G	G	O	G	O	O	O	G	G	O	—	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia albicans Robin emen. Castellani and Chalmers	G	G	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	+	+	O	White	
Monilia tropicalis Castellani	G	G	G	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia metatropicalis Castellani	G	G	G	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	C	White	
Monilia rhoi Castellani	G	G	O	G	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia guillermondi Castellani	G	G	O	O	G	O	O	O	O	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia pseudoguillermondi Castellani	G	G	O	O	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	C or P	White	
Monilia macedoniensis Castellani	G	G	O	G	G	O	O	O	O	O	O	O	G	O	O	O	O	O	O	O	O	O	O	C	White	
Monilia macedoniensoides Castellani	G	G	O	G	G	O	O	O	O	O	O	O	G	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia chalmersi Castellani	G	G	O	G	G	O	O	O	O	O	O	O	G	O	O	O	O	O	O	O	O	O	O	O	Dark brown	
Monilia parachalmersi Castellani	G	G	O	G	G	O	O	O	O	O	O	O	G	O	O	O	O	O	O	O	O	+	O	C	White	
Monilia bronchialis Castellani	G	G	G	O	G	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia pseudotropicalis I.	G	G	O	G	G	G	O	O	O	O	O	G	O	O	O	O	O	O	O	O	O	O	O	C	White	
Monilia pseudotropicalis II	G	G	O	G	G	G	O	O	O	O	O	O	G	O	O	O	O	O	O	O	O	O	O	O	White	
Monilia pseudotropicalis III.	G	G	O	G	G	G	O	O	O	O	O	O	G	O	O	O	O	O	O	O	O	O	O	C	White	
Monilia pseudotropicalis IV	G	G	O	G	G	G	O	O	O	G	O	O	G	O	O	O	O	O	O	O	O	O	O	O	White	

G=production of gas. C=production of clot. O=negative results, viz., gas absent, no clothing.

TABLE II.

SIMPLE CLASSIFICATION OF YEAST-LIKE FUNGI FOR THE USE OF CLINICAL PATHOLOGISTS.

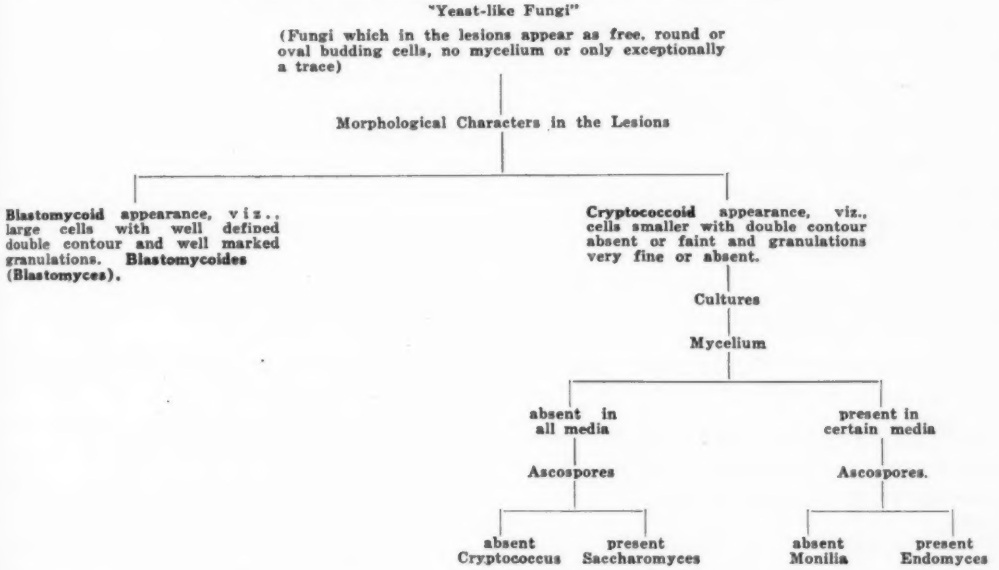
Yeast-like Fungi (viz.) fungi which in the lesions appear as round cells, some of them budding, with no mycelium or exceptionally a trace).

Examine morphological characters in the lesions

- Blastomycetoid type, viz., large cells with well defined double contours and well-marked granulations, genus **Blastomycoides (Blastomyces).**
- Cryptococcoid type, viz., cells smaller with double contour absent or faint ,and granulations very fine or absent.
  - I. Mycelium absent, ascospores absent—**Cryptococcus sensu lato.**
  - II. Mycelium absent, asceaspores present — **Saccharomyces sensu lato.**
  - III. Mycelium present, ascospores absent—**Monilia sensu lato.**
  - IV. Mycelium present, ascospores .....present—**Endomyces sensu lato.**

TABLE III.

Key to the Principal Groups of Yeast-like Fungi (Budding Fungi).


"Yeast-like Fungi"
(Fungi which in the lesions appear as free, round or oval budding cells, no mycelium or only exceptionally a trace)
Morphological Characters in the Lesions
Blastomycoid appearance, viz., large cells with well defined double contour and well marked granulations. Blastomycoides (Blastomyces).
Cryptococcoid appearance, viz., cells smaller with double contour absent or faint and granulations very fine or absent.
Cultures
Mycelium
absent in all media
present in certain media
Ascospores
Ascospores.
absent Cryptococcus
present Saccharomyces
absent Monilia
present Endomyces

krusei, M. metalondinensis, M. tropicalis and *M. macedoniensis,* which possess permanent biochemical characters.

Further details on classification of the various species of the genus Monilia may be found in the Manual of Tropical Medicine (Castellani and Chalmers, footnote 3, p. 1081).

Pathogenicity and Virulence.—The subcutaneous, intravenous or intrapulmonary inoculation of some monilias into rabbits does not produce any symptoms; other monilias are virulent and cause the death of the rabbit. It is interesting to note that monilias with identical biochemical reactions may vary enormously in their virulence: some strains may be quite avirulent, while others are exceedingly virulent.

PRINCIPAL CLINICAL TYPES OF BLASTOMYCOSIS SENSU LATO

All dermatomycoses due to "Yeast-like fungi'" (or Budding Fungi) come under the designations Blastomycosis *sensu lato.*

A. Mycotic infection deep:

1. Blastomycosis Gilchristi.
2. Blastomycosis Wernikeli.
3. Blastomycosis Kartulisi.
4. Blastomycosis Bussei.
5. Blastomycosis furunculosa.

6. Blastomycosis pyotica (including paronychia blastomycetica, vel moniliaca, vel cryptococcica).

B. Mycotic infection superficial:

1. Intertrigo blastomycetica, vel moniliaca, vel cryptococcica, vel saccharomycetica.

2. Cryptococcosis epidermica.

3. Prickly heat according to certain authorities.

PRINCIPAL CLINICAL TYPES OF BLASTOMYCOSIS SENSU STICTO.

The principal types of blastomycosis cutis are the following:

(1) Blastomycosis verrucosa (syn. Blastomycosis, Gilchrist type).

(2) Blastomycosis ulcerativa profunda seu mutilans (Blastomycosis, Wernike-Posadas-Ophül type or Coccidioides type or Californian type).

(3) Blastomycosis purulenta profunda (syn. Blastomycosis, Busse type).

(4) Blastomycosis glutealis (syn. Blastomycosis, Kartulis type).

(5) Blastomycosis furunculosa (syn. Blastomycosis furunculosa, Furunculosis blastomycetica.

(1) BLASTOMYCOSIS VERRUCOSA.

(Synonym: Blastomycosis, Gilchrist type.)

Clinical Symptoms.—This type is characterized by raised, roundish or oval patches with a verrucoid papillomatous or framboesiform surface, somewhat similar to tuberculosis verrucosa cutis, and in certain cases framboesia. The patches are not rarely surrounded by a violaceous halo. The following subtypes may be differentiated:

(1) Affecting usually the skin only, but may, in addition, in a later stage affect the mucosae and internal organs; found all over the world, but principally in tropical and sub-tropical countries—Gilchrist type, *sensu stricto.*

(2) Affecting solely or principally the oral or nasal mucosa; this type is especially common in South America. It is known also as South American oral blastomycosis or blastomycosis Lutz-Splendore type, and a description of it may be found in Castellani and Chalmers' "Manual of Tropical Medicine," third edition, p. 2084.

(3) Affecting the tongue, causing at times an enormous increase in the size of this organ (macroglossia blastomycetica).

(4) Affecting first the skin and later the internal organs, with symptoms of general infection and pyaemia (systemic blastomycosis).

To the above four subtypes a fifth one may be added to include a group atypical cases in which the granulomatous framboesiform pustules are practically absent and only gumma-like swellings and sinuses are present.

Etiology.—The fungi found are yeast-like fungi of the *Blastomyces* type (genus *Blastomycoides*, p. 261).

Diagnosis.—In many cases the diagnosis can be made on clinical grounds, but it should of course always be confirmed by mycological methods.

Treatment.—If the diagnosis is made at an early stage potassium iodide may at times induce a cure provided it is given in massive doses and for long periods of time.

Prognosis.—This is serious; if the diagnosis is made at an early stage and an appropriate treatment given, a complete cure may be obtained.

ILLUSTRATIVE CASES.

I will briefly quote ten cases among those I have had the opportunity of investigating.

Case I.—Mr. M. while in Egypt during the Great War, noticed a papule near the left angle of the mouth, which later became moist and was covered by a small yellow crust. Other papules appeared and a patch formed. He reported to the medical officer who suggested syphilis. The Wassermann reaction was negative; he had, however, a course of neosalvarsan without any benefit. During this treatment the condition spread

to the mucosa of the lips and later to the tongue. After leaving the Army he consulted various medical men some of whom suspected syphilis, others a tuberculide. Finally, in 1920, he went to see Sir James Cantlie, who kindly referred him to me. I suspected blastomycosis, and succeeded in growing a fungus, which recent investigation has shown to be very similar to *Blastomyces tulanensis*. After several relapses he apparently recovered completely after a treatment of potassium iodide in large doses and vaccine.

Case II. (blastomycosis of the nose). Mr. T., of Bradford, consulted me in January, 1921; he had a rather large papillomatous mass on the left ala of the nose, with severe loss of substance. The condition had started during the war while the patients was in the Balkans, and had been considered a syphilide or a tuberculide. He had been treated with salvarsan, mercurial preparations and X-rays. I grew a fungus with characters somewhat similar to blastomycosis dermatitidis; in addition, a monilia-like fungus was grown with all the biochemical characters of *Monilia metalondinesis*. The condition yielded to potassium iodide in massive doses, but it took more than a year for a complete cure to be achieved.

Case III. (Mild type of oral blastomycosis.)—Master N. four years ago showed white patches on the tonsils and oral mucosa, apparently very similar to patches of thrush. Later several flattened nodules developed on the mucosa of the lower lip with a papillomatous surface. For these patches various diagnoses were suggested and various treatments were carried out without any benefit. He consulted me two years ago. The surface of one of the patches was scraped and from the deep parts of the lesion a fungus was found with the characters of a monilia, biochemically similar to *Monilia metalondinensis*.

The characters of the fungus are briefly the following:—In the lesions only roundish budding cells are seen; in cultures a slight amount of mycelium is present. Milk not clotted. Gas produced in glucose, levulose, maltose and galactose.

Case IV. (blastomycosis of the tongue) *Macroglossia blastomycetica*.—In Ceylon, during the period 1903-1915, I observed three cases of a peculiar type of macroglossia of blastomycotic origin. Four years ago an interesting case of the same type was kindly sent to me by my friend, Dr. Broughton Alcock. The tongue was enormously enlarged and occasionally painful; the patient felt discomfort in eating and difficulty in speaking; he could not whistle; the surface of the tongue was somewhat roughened in places, but no very typical verrucoid patches were present.

Deep scrapings were made from the tongue, after drying and painting with tincture of iodine, and cultures were made. A fungus was grown, which I at first placed in the genus *Cryptococcus*, and later in the genus Monilia; *Monilia macroglossiae*. (For description of the fungus see page 264). A prolonged treatment with potassium iodide in very large doses and fungus vaccine induced an apparent cure.

Case V. Mr. N., a white workman in New Orleans, two years ago, developed verrucose patches on the hands and forearms and on the face. A fungus was grown with the characters of *Blastomycoides dermatitidis*.

Case VI. Mr. R. New Orleans. Typical patches on the face and arms. I was asked by Dr. Hopkins to investigate the case. A fungus was grown with the characters of *Blastomycoides tulanensis*.

Case VII. Negro, New Orleans. Framboesiform lesions on face. I was asked by Dr. van Studdiford to investigate the case mycologically.

Case VIII. Mrs. B., New Orleans. Large verrucoid patches on the right forearm. A fungus was isolated with the characters of *Blastomycoides tulanensis*.

Case IX. Mr. O. P., New Orleans. Typical verrucoid patches on the face. A fungus was isolated with the characters of *Blastomycoides tulanensis*.

Case X. Young negro girl. Articular and periarticular lesions, gumma-like swelling and sinuses closely simulating tuberculosis. After a time she developed signs of broncho-alveolitis and of meningitis. At the post-mortem the lungs and all internal organs were found studded with white nodules of blastomycetic origin. *B. tulanensis* was isolated.

(2) BLASTOMYCOSIS ULCERATIVE PROFUNDA.

This type was described first by Wernike. The ulcerative lesions are deeper and free prognosis is always had.

(3) BLASTOMYCOSIS PURULENTA PROFUNDA.

(Blastomycosis, Busse type; Blastomycosis subcutanea purulenta).

This type of blastomycosis is considered a variety of blastomycosis cutis for convenience sake. It is characterized by the presence of subcutaneous and deep abscesses, and purulent conditions of the bones, periosteum, and internal organs. The skin proper is not usually affected,

and the verrucoid framboesiform patches are absent.

Etiology.—The condition is caused by *Cryptococcus hominis* Vuillemin, 1901, a term which probably covers several varieties or even species.

Cryptococcus hominis Vuillemin, 1901.—(*Synonyms*: *Saccharomyces* (sp.? Busse, 1894; *Atelosaccharomyces bussebuschki* de Beurmann and Gougerot, 1909; *Atelosaccharomyces rudeli* de Beurmann and Gougerot, 1911).

Found by Busse in abscesses in a woman. In the pus the fungus presented itself in the shape of oval bodies, with a membrane having a double structure. These elements were arranged in groups, each group embedded in an amorphous substance and surrounded by a capsule. Culturally the fungus showed only roundish building forms, no mycelium, no asci. Growth on solid media generally white. Gelatin not liquefied. Glucose fermented Pathogenic to rabbits, white mice and dogs.

(4) BLASTOMYCOSIS GLUTEALIS.

This condition was described by Kartulis some years ago in Egypt. I have often observed it in Ceylon. The skin of the gluteal region—one nate or both nates—presents a diffuse induration, and in cribrated with the opening of sinuses, from which a thin pus exudes. The sinuses may be very deep and connected with each other, but in cases I have seen did not connect with the intestine. The pus does not contain grains, as is the case with actinomycosis. The patient may complain of pain and discomfort on sitting down. The disease is chronic.

Etiology.—The mycological investigation of the condition cannot be considered completed. The fungi found seem to belong to the genus *Monilia* and the genus *Cryptococcus*. One of them has been imperfectly described as *C. kartiulisi*.

(5) BLASTOMYCOSIS FURUNCULOSA.

Synonyms.—Folliculitis decalvans cryptococcica, *pro parte*, furunculosis cryptococcica; pseudofurunculosis blastomycetica; furunculosis moniliaca; furunculosis mycetica; folliculitis decalvans saccharomycetica; folliculitis decalvans moniliaca.

History.—Some years ago I described a peculiar type of bastomycosis indistinguishable clinically from ordinary furunculosis, which I called at the time "furunculosis cryptococcica," and as the condition in the first two cases affected principally the scalp under the form of a purulent folliculitis and loss of hair, I also suggested for it the term "folliculitis decalvans cryptococcica." To date I have seen five cases: three patients contracted the infection in Great Britain, and two in India.

Etiology.—The fungi found are yeast-like, and it is difficult to decide whether they belong to the genus *Cryptococcus* or to the genus *Monilia*. One of them (*Cryptococcus castellanii* Re) was fairly completely described by me, and later by Dr. Re, who named it *Cryptococcus castellanii* (p. 264). The strains of fungus isolated from the Indian cases are somewhat different from the organisms grown from the English cases, and differ also, though slightly, among themselves.

Symptomatology.—The clinical picture of this blastomycosis is totally different from the usual types of blastomycosis cutis, which are characterized by the presence of patches with vegetating capillary excrescences which give them a characteristic verrucose or warty appearance.

Furunculosis blastomycetica is clinically indistinguishable from ordinary severe furunculosis. Boils indistinguishable from ordinary boils, may be present on the face and body, but the region mostly affected, as a rule, is the scalp. In this region numerous pustules, flattened or conical, each pierced by a hair, may be seen; in addition, there may be infiltrated lesions

which somewhat resemble flat carbuncles, and later open and discharge through several openings.

The hair in the infected areas falls off, and patches of baldness, sometimes permanent, remain.

ILLUSTRATIVE CASE.

Mr. D., married, aged 34, a Dane who had resided in London for twelve years preceding admission; he was fond of all outdoor sport, and was a famous football player. The condition started in March, 1921, with apparently follicular pustules on the scalp, and two or three furuncular-like lesions on the forehead and face. Later, extremely painful carbuncle-like lesions developed. A bacteriologic examination of the pus was made at a well-known clinical laboratory in London, and *Staphylococcus aureus* was found. An autogenous staphylococcus vaccine and also a stock vaccine were given for eighteen months without any benefit. On the advice of his medical attendant the patient then came to consult me.

Apart from the boil on the left forearm and one on the supraorbital region, all the lesions were on the scalp; several patches of baldness, with the skin smooth and whitish, were plainly visible; there were also numerous follicular pustules, some flat, some conical, and most of them surrounded by a zone of hyperaemia. Two extremely painful carbuncle-like lesions, one not yet opened and the other with several openings discharging, were present. I made a bacteriologic and a mycologic examination. Microscopically, the pus contained only gram-positive cocci. The dextrose-agar tubes inoculated with the pus showed abundant growth of Staphylococcus aureus. The microscopic examination of the growth, however, showed here and there a yeast-like cell in several tubes. After plating and replating, this yeast-like organism was isolated with great difficulty. Later, I grew the same fungus from a number of lesions, some of which were unopened.

It was a cryptococcus with the following principal characters: Cultures on dextrose agar were abundant with a smooth surface, at first white and later yellowish. The fungus did not produce gas in any carbohydrate at first; later, it caused production of gas in dextrose and levulose. It was agglutinated by the patient's blood in high dilution (1 in 400). An interesting point arises: Which organism was the true causative agent of the condition, the cryptococcus or the staphylococcus? In my opinion, it was the cryptococcus, for the following reasons: Staphylococcus vaccines did not have any beneficial action whatever. The cryptococcus was agglutinated by the patient's blood, and the condition improved and finally disappeared under a treatment consisting of massive doses of potassium iodide given internally, and a cryptococcus vaccine subcutaneously injected. It is well known that potassium iodide does not have any beneficial action on *Staphylococcus furunculosis*, it makes it much worse.

Diagnosis.—The diagnosis can be made only by mycologic method. In all cases of persistent furunculosis that do not answer to staphylococcus vaccine, the possibility of furunculosis blastomycetica should be kept in mind.

Prognosis.—The disease does not have a tendency to spontaneous cure.

Treatment.—Potassium iodide in large doses, given for long periods, often induces a cure. A vaccine prepared with the fungus seems to be useful, but used alone is not sufficient to bring about a cure.

PERIONYCHIA CRYPTOCOCCICA VEL MONILIACA.

Synonyms.—Perionychia saccharomycetica; Perionychia mycetica; Perionychia blastomycetica.

In patients suffering from Blastomycosis furunculosa a painful type of perionychia may develop associated with the presence of budding fungi usually of the genera *Monilia* and *Cryptococcus*, occasionally of the genera *Saccharomyces* and *Debaryomyces*. At times the lesions come to suppuration, at times the parts remain inflamed and painful for months but no suppuration develops.

SUPERFICIAL TYPES OF BLASTOMYCOSIS SENSU LATO CRYPTOCOCCOSIS EPIDERMICA.

Synonym.—Blastomycosis epidermica.

Remarks.—Blastomycosis epidermica was described by me in Ceylon some years ago. Clinically, it has nothing to do with the usual types of blastomycosis, but it may be called blastomycosis, as it is caused by a yeast-like organism.

Synonyms.—Saccharomyces epidermica; Cryptococcus epidermica.

History and Geographical Distribution.—While in Ceylon, I noticed on the skin of one of my bungalow servants several

brownish, dirty-looking patches, which looked very much like dirt. He told me, however, that they did not disappear when soap was used. I made scrapings and saw that these patches consisted of a large number of budding cells which I believed to be saccharomyces. I found the same patches not only in other natives but also in Europeans, especially on the chest and arms, and I called the condition "saccharomycosis epidermica." I did not succeed in growing the fungus. Chalmers and others confirmed my observations in the Sudan and North Africa, but the organism has not yet been cultivated.

Etiology.—The causal organism is *Cryptococcus epidermidis* Castellani, 1914.

Symtomatology.—The condition is fairly frequent in natives and Europeans who have resided for some years in the tropics. It is characterized by the presence on the arms, and more rarely on the chest and neck, of small, roundish, dirty, yellow or brownish patches, which can generally be removed by thorough scraping. These patches consist of large numbers of blastomyces-like elements of various sizes, rounded or oval, which, so far, have not been cultivated.

Clinical Variety of Blastomycosis Epidermica. — Blastomycosis (cryptococcosis) epidermica alba and rosea; white patches, consisting solely of yeast-like fungi, without inflammatory signs, are occasionally seen, especially in natives. I have grown the fungi several times; they belong to the genera *Cryptococcus, Saccharomyces* and *Monilia.* In a case with pinkish patches, a cryptococcus was present which when cultivated on laboratory media gave rise to pink colonies.

INTERTRIGO CRYPTOCOCCICA VEL MONILIACA. INTERTRIGO BLASTOMYCETICA AND DERMATITIS BLASTOMYCETICA INTER DIGITALIS.

(*Synonyms*) :—Intertrigo saccharomycetica; intertrigo cryptococcica; intertrigo moniliaca.)

Intertrigo blastomycetica was first described by me in Ceylon in 1907. In Europeans, the affected skin—usually the skin of the inguinal region—is reddened, and there may be a slight exudation. The border of the eruption may be fairiy well marked, but it is not distinctly raised. In many cases there is not much itching. In 1907, in scrapings, I found a yeast-like fungus which I called *Saccharomyces samboni.* In other cases I found organisms of the genera *Monilia* and *Cryptococcus.* In recent years a similar condition, saccharmycosis or blastomycosis interdigitals, has been dscribed by several observers, and I have seen some cases myself and Pollaci has called one of the cryptococcus-like fungi found in it *C. interdigitalis.* In the majority of my cases an epidermophyton was present in addition to numerous yeast-like bodies, that is, in superficial scrapings only yeast-like organisms were present, while in deep scrapings the yeast-like fungus disappeared or was extremely scanty and an epidermophyton was present.

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DISCUSSION.

Dr. C. C. Bass (New Orleans): I feel unable to add any discussion to this paper by Dr. Castellani, who is generally recognized as one of the world's authorities on this subject. I wish to comment on the fact that since Sir Aldo came to New Orleans and has directed attention to these diseases due to fungi, we have come to recognize that there is a very much wider distribution and greater prevalence than formerly had been recognized. They have been overlooked to a large extent, and while Dr. Castellani does not attach so much importance to them, there is no doubt but that they are of a great deal of importance.

I should like to emphasize the fact that discovery and diagnosis of these diseases is dependent upon proper microscopic and laboratory examinations. It is the proper and constant use of these methods which has enabled Dr. Castellani to recognize and demonstrate the prevalence of these diseases due to fungi which had formerly been overlooked, to some extent at least.

Dr. Foster Johns (New Orleans): I am afraid that Dr. Bass' apology will have to apply to me as well. Dr. Castellani has covered this subject very thoroughly.

I have observed that the incidence of the disease in the population in the Charity Hospital of New Orleans is approximately one per thousand, so that blastomycosis is certainly not a negligible disease, and yet ten years ago it was practically unrecognized.

From a public health standpoint the prevention of blastomycosis would be most difficult, from a general standpoint, and certainly resolves itself purely into a question of early diagnosis with proper treatment and safeguarding of the spread of the disease in those individuals who are found to be infected. While it has not been proven that the blastomyces does not exist in nature or as a parasite of some plant or putrefying foodstuff, I must believe that the parasite is limited to human tissue and that the disease is transmitted from patient to patient. The majority of the cases I have seen were apparently contracted from contact with other patients.

I know of no disease where it is more necessary to make a diagnosis by direct microscopic examination, looking for the organisms in digested scrappings of the granulomatous lesion or in histologic sections obtained from the lesions. It is necessary to suspect the disease first and then every effort should be made with microscope to prove the diagnosis. Another point that Dr. Castellani did not cover in much detail is the fact that in a goodly proportion of these cases, if allowed to remain untreated for any length of time, metastasis will occur to the visceral organs and particularly the lung and pleura. Cases of bronchietasis and other pyogenic diseases of the lungs in which tubercle bacilli are not found should be searched carefully for blastomyces. Reliance should not be placed on cultures. The sputum or pleural exudate should be digested with an equal part of 10 per cent potassium or sodium hydroxide and allowed to digest for an hour, the material then being centrifuged and the sediment searched for the characteristic double-walled, yeastlike, budding fungi.

Question: I would like to ask Dr. Castellani whether potassium iodide should be given in gradually increasing doses up to the massive dosage that he recommends or does he immediately begin with the enormous doses that he recommends in a general way, and, further, how long can a patient tolerate the enormous doses that he deems as being needful?

Dr. J. A. Devron (New Orleans): I have the honor and the pleasure of being on the staff at the Charity hospital. Before letting this subject pass, I thought I would get on the floor and let our general practitioners know a few general conditions of the skin, which they might confuse with the blastomycosis, and other diseases which they might pass over. If you gentlemen get an ulcer of any part of the body, clear cut, I would not blame you if you would call it a luetic ulcer, even if a Wassermann were made and the Wassermann would not verify that statement.

On the other hand, if you have walls sloping like a volcano on the moon, you could expect that you have a blastomycetic lesion. Sometimes you get another sore which might look like an old boil, lots of sinuses, the top is soft, but you say to yourself, "that is not a carbuncle, because the surrounding tissue is different." Then you have to appeal to the laboratory man, but do not depend on the pus, you must have scrapings for certain types of blastomycosis. You will not find the granules or germ in the pus, you have to get it from the surrounding tissues. Sometimes we get a lesion that looks like ringworm; it may be tuberculosis of the skin or lues. If you suspect tuberculosis of the skin, and if you want to be exact, let the laboratory man make scrapings, see if you find the tuberculosis bacillus. You also have cutaneous scrapings made to see if it is blastomycosis or not. Suppose you suspect lues, again send for the laboratory man to determine whether it is luetic or not.

As regards treatment, I have been taking up skin diseases for five years, and in the last three years I have run across a lot of these cases. I did not recognize them years ago. Regarding treatment I have come to the conclusion, like

Dr. Castellani, that we waste valuable time if we start with small doses of iodide of soda.

If the people are in the hospital and I can get proper technic, I get quicker results by giving iodide of soda in a sterile solution, starting at five grains increasing it up to forty grains at a dose by the intravenous route. The results are remarkable.

Dr. Aldo Castellani (New Orleans): I am in complete agreement with Dr. Bass, not with regard to the very kind compliments he has paid me, but with regard to the importance of blastomycosis and other fungal diseases, and also to the importance of a microscopical examination. When I say that, in many cases the diagnosis can be made on clinical grounds, I did not for a moment mean that the clinical observation alone was sufficient to make the diagnosis an absolute certainty.

I quite agree with Dr. Bass and Dr. Johns that a microscopical examination, and I would go farther, a cultural examination, is essential. With regard to the frequency of the condition, the remarks made by my friend, Dr. Johns, are very interesting. I did not know that the disease was as common as that in Louisiana, although I have come across quite a fairly large number of cases.

With regard to the blastomycosis affecting internal organs, I agree with Dr. Johns that this is a very important point, and, as a matter of fact, in my paper there is a section on it. It is very important from a practical standpoint of view to come to the conclusion whether the internal organs have already been affected or not.

If the lungs and other internal organs have not yet been affected, provided that proper treatment is given, the prognosis is fairly favorable, comparatively speaking, of course, but if the lungs are affected, or if any of the internal organs are affected, then the prognosis is very bad; in fact, I should say, hopeless.

Those cases we have seen at the Charity hospital, if they had any lung or bronchial complications, none of them recovered. In this connection, I should like to express my thanks to Dr. Menage and Dr. Hopkins and Dr. Talbot, and the other members of the dermatological clinic for their kindness in allowing me to investigate their cases.

With regard to the question put forward by the third speaker, whether I give potassium iodide gradually, by increasing doses, or whether I start straight away with huge doses, I generally start with the large doses immediately. The disease is so serious, and the only chance of recovery in my experience resting upon giving huge doses of potassium iodide, that in practically every case I begin by giving thirty grains three times a day, and after two or three days I go to one dram three times a day. In this connection, I might say, I have found it useful to combine the iodide treatment with an alkaline treatment. A mixture which I have found extremely useful is the following:

Potassium iodide one dram, bicarbonate of soda thirty grains to one dram, glycerin one dram, syrup one dram and water to an ounce. That is one dose. I give it well diluted with water three times a day.

DIET—AN IMPORTANT FACTOR IN HEALTH AND DISEASE.*

ALLAN EUSTIS, M. D.,

NEW ORLEANS.

For fifty years we have been dieting, or feeding our horses, pigs and cows on a scientific basis, and the most ignorant farmer is in a position to obtain data from the State Department of Agriculture as to the best food suited for the particular animal on his farm. However, it is astounding to think that attention to the feeding of the human being has only been within my limited experience. I might say that the work of my former Chief, Professor Chittenden, did as much as any one else to focus the attention of the layman to this important feature of medicine, as well as hygiene.

In 1898, I was associated with him in the work which he did for the United States Army, in which he showed that the soldiers could do better and more efficient work on but one-third of the amount of protein that they were then being given as a ration. Later we find that, due to this, certain individuals went to the other extreme, and they cut the protein intake to such an extent that certain definite diseases were manifested. Chamberlain and Vedder, working in the Philippines, established the fact that beri-beri was caused by a deficiency in the diet of something which was contained in rice polishings.

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*Read before Louisiana State Medical Society, Baton Rouge, April 10-12, 1928.

During this investigation, Casmer Funk was able to extract from the polishings from rice, a substance which he identified as an amine, and inasmuch as the introduction of this substance into animals or human beings that were prone to develop beriberi, prevented its development, he called this substance vitamin. We now know it was not an amin as these essential foodstuffs that we recognize now under the general term vitamins, are not really amins, and they are probably none of them of the same chemical composition. However, the important fact that was brought forward by Chamberlain, Vedder, Funk and others was that, beside the protein, fat, and carbohydrate, there are essential substances that must be taken in the diet in order for our tissues to properly metabolize these fundamental foodstuffs. Since then, through the work of McCullom, Mendel, Osborne and others there have been identified four vitamins. McCullom was the first to bring out the fact that there was one of the vitamins soluble in fat and found especially in cod liver oil, the so-called fat soluble vitamin "A."

Mendel and his co-workers showed that yeast contained large amounts of water soluble, or vitamin "B." Today, we find large amounts of literature circulating through the medical profession and also to the layman, laying a great deal of stress upon these vitamins; the yeast being lauded as the cure for all ills, and cod liver oil and different extracts of cod liver oil also as a cure for all.

It is well for the profession to bear in mind that these vitamins are in nature well distributed, and an individual living a normal life and not living on canned goods, is in no danger of developing a disease, due to the vitamin deficiency. Nature, fortunately, has provided us with ample vitamins in its copious supply of foodstuffs throughout the country. The important factor to remember is that all the vitamins, whether they be "A," "B," "C" or "D," are destroyed by heat, and that is why a diet exclusively of canned goods will show evidence of a deficiency. Diet is a public health question and it should be the duty of the Boards of Health to distribute knowledge regarding diet to the layman, because we see now that whereas liver, which was spoken of as the poor man's beefsteak, could be procured for ten cents a pound, has now risen to forty cents a pound, why? Because, due to the work of Miner, Whippel and others it was shown that blood regeneration was stimulated by something that was contained in liver, overlooking the fact that kidneys, as well as fresh meat, contained this substance. Striped muscle fiber contains it, but not to the extent which liver does.

There is no doubt that giving liver to an individual with primary or secondary anemia does stimulate their blood cells, but the profession, as well as the layman, should be warned that whereas you may be attempting to restore your blood count to normal, that if that individual has a damaged liver or damaged kidney such a diet of a pound of liver per day may be distinctly injurious. We must individualize in dieting, as well as in the prescribing of medicine.

There is no doubt that nature can repair damage to certain tissues if spared work by suitable diet. They are paying a great deal of attention in the public schools to diet, from a caloric standpoint, but it is not so much a question of calories, as it is a question of quality. The layman should know what is to be expected when he eats a piece of meat or drinks a glass of milk. It is well for them to know the chemical changes that take place. Unfortunately, few of the physicians know it, so, again, I say that the question of diet is one of public health. We see the trend of thought today by the numerous editorials that you find in the Journal of the American Medical Association.

I can remember when I first started the practice of medicine, when no attention at all was paid to diet. Today, there is hardly a number of the Journal that comes out in

which there is not an editorial on diet. There are certain fundamental facts that the physician often overlooks in the diet of his patients, notably (a) the fact that the percentage or the amount of protein intake should be in direct proportion to the amount of muscular effort the individual is exerting, (b) that protein in the diet is given primarily to replace worn out tissues, presupposing, of course, that sufficient calories are given in the form of carbohydrates and fats so as to spare burning up of the tissues.

Now, in an individual in bed, at rest, his protein needs are very, very little, and his diet should be calculated on a basis of restoring the amount of fuel lost by dissipation of heat. The individual with fever, therefore, will require relatively more calories or more fuel heat units than the individual with a normal temperature, but both of these individuals require one-third as much protein as when they are up and about.

Now, this is a fact that many physicians overlook, and they further overlook the fact that protein ingested over the needs of the body throws unnecessary work not only on the liver, but on the kidneys.

Another point that the physicians often overlook, especially in the treatment of inflammatory conditions of the intestinal canals, is "what happens to a particular meal when it is eaten? How much residue?" There is no doubt that the average physician would consider the advisability of resting his patient if he has a sprained ankle; if he has a decompensated heart, he will put him to bed; but when he has an inflamed condition of the intestinal canal he pours milk into it, or other foods with large amounts of residue.

In the treatment of these diseases, notably in amoebic dysentery, it is surprising how much more rapid the relief will be, if the individual is kept on what we call a "soluble" or low residue diet.

There are some interesting experiments that have been carried on recently, in which it is surprising to know that as far as the residue of the diet is concerned *milk* leads the top as giving *more residue*, and that a hard-boiled egg will give less residue in the intestinal canal than a raw egg. The reason of this, I will not go into it, is on account of the fact that the raw egg has an anti-ferment in it, and it is more difficult to digest. These are points I want to bring out as claiming the attention not only of the Medical Profession, but the layman.

A point that enters into this question from a public health standpoint is the recent rise, I won't say recent, but the past quarter of a century, in the consumption of sugar. It will astound you to know that in 1823 the per capita consumption of sugar in the United States was nine pounds, while in 1924 that amount had risen to one hundred and ten pounds per capita. Whether this large consumption of sugar will necessarily overwork the pancreas, will increase diabetes, remains to be seen, but, certainly, this one factor will impress upon you that diet is a public health question.

Time will not permit me to go into the various types of diet indicated in the different diseases, but I again wish to emphasize the fact that let us pay more attention to diet and probably we will have fewer diseases to treat.

DISCUSSION.

Dr. J. E. Knighton (Shreveport): Mr. Chairman and Members of the Louisiana Medical Society:

I have listened with interest to Dr. Eustis' paper, and I fully agree with the statement made by him that the question of diet is not simply a question to be dealt with in reference to disease, but must be considered as a public health question.

I think the members of the medical profession, with few exceptions, have neglected the study of dietetics in a serious way. I believe that the development of insulin for the treatment of diabetes has done more to stimulate the study of this subject than anything else, for the reason that it is impossible to use insulin intelligently without a proper study of the patient's dietary requirements.

I am sure that Dr. Banting did not realize while he was developing insulin he was likewise stimulating an enthusiastic study of dietetics by the profession at large.

I think it is the duty of the medical profession to teach the public along the lines of diet in relation to public health. This may be done by private and personal contacts as well as by properly prepared articles for the public press and by public addresses on proper occasions.

There is much rubbish regarding diet served to the public by faddists that it is up to us to interpret these fads and fancies properly for the people and give them instead more sane and wholesome information on the subject.

I think we can take Dr. Eustis' paper as a profitable lesson to ourselves, and then we should pass it along to the public.

Dr. D. O. Willis (Leesville): I am not going to discuss the question of the disease itself, I am just going to discuss a little bit the question, or to drop the thought that might bear fruit, of how we are to get this knowledge to the people, relative to the prevention of cancer, and the question of diet, as spoken of in the previous paper, Dr. Eustis' paper, and I bring this thought because of the fact that I live, myself, and work in a country where literature cannot very satisfactorily serve the purpose of getting this knowledge to the people, because of the fact that there is a large number of people in the rural district of this state, others, I suppose, that do not read, lots of them that cannot read, unfortunately. We hope, of course, that in just a few years this will not be so, but we know now that it is.

If you put the proper literature in their hands, they would not read it, lots of them, even though they could, and lots of them cannot. So, just how are we to get this knowledge to the people? I would ask that as a question to the essayists, and to men, perhaps, of broader experience than I have. We cannot advertise, and just how shall we do it is the thought that comes to my mind.

Now I have thought of this as a possible plan, that by some means, from some source, that there be lectures and talks carried to these people in the rural districts. Perhaps, to the schools, by inviting the public to attend such lectures. I have thought about it, as a duty, perhaps, with the local health officer, or especially where we have the health units in various parishes, fixing it as a duty that he would invite the public to meet at some place, perhaps the schools would be the best place, and visit those institutions or those places at least once a year, every school, or every designated place, and if he is not capable of delivering an intelligent address, have the proper literature in his hands, coming from the proper sources, and read it to the people, and do what might be done in that way. But, I just wanted to suggest this thought, in order that there might perhaps be some plan worked out to get this knowledge to the public, that they might understand.

Dr. S. B. Wolff (Opelousas): The science of dietetics is always a very timely subject at any meeting of physicians. The early doctors recognized that diet was one of the chief adjuncts in both the prevention and cure of disease.

Among the diseased conditions, today, that are met along dietetic lines I might mention tuberculosis, diabetes, scurvy, beriberi, and, in addition, we believe that diet is an etiological factor in the causes of high blood pressure and nephritis. Science is undergoing, of course, rapid changes, to the betterment of the profession. In a discussion of diet, I think that some recognition should always be paid to the group of our profession, namely, the pediatricians, the workers who approve the babies, the young people, so that we might safely say, in future, the race in general will be improved through their efforts.

I have especially enjoyed Dr. Eustis' paper and coming from a man who has made a big study of dietetics it should have great effect.

Dr. Allan Eustis (closing): I have nothing further to say, Mr. Chairman, except to thank Dr. Knighton and Dr. Wolff.

SOME OF THE PROBLEMS OF AN INDUSTRIAL SURGEON.*

DAVID WALLEY, M. D.,

LUMBERTON, MISS.

I am presenting a short paper giving you some of the problems that I have had to deal with as an industrial surgeon. It is not my purpose to write a scientific paper but to deal with the problems connected with the handling of sick and injured employees of industrial plants and the prevention of accidents. Industrial surgery today is indeed a specialty though not so recognized by the profession. The larger corporations throughout the country have in recent years given more attention to the medical services of their employees than in former years. Especially is this true since the World War. The after effects of the World War have proven one thing if nothing else—and that is that it is an expensive proposition to the employer when an individual is physically unfit to fill the position for which he is

*Read by title before the Mississippi State Medical Association, Meridian, May 10-12, 1928.

employed. The American Government today is spending millions upon top of millions of dollars caring for the veterans of the World War and other wars because they accepted into the service men who were physically unfit. Those of us who saw service in the World War have profited by the mistakes or should have profited by the mistakes made by us in examining men for the Army, and ought to be now able to render corporations a real service in assisting them in securing suitable employees, physically, mentally, and morally.

To be a successful industrial surgeon, one must possess five distinct qualifications: First, he must be a diplomat, because he has to deal with employees who in a great many instances are biased against company doctors; second, he must be a good diagnostician, because his competitors will put him to the acid test almost daily; third, he must be a competent surgeon, because both employer and employee demand good work; fourth, he must have a working knowledge of orthopedics, because a majority of his major accidents are injuries to the bony parts, and, fifth, he must be well versed in medical jurisprudence, because he is a victim of court procedure. The industrial surgeon must be equipped with hospital facilities to handle his sick and accident cases. The hospital must be equipped with a complete roentgen-ray (including a portable) and clinical laboratory. He must also have a fracture table and almost every orthopedic appliance known to man, including physiotherapy. The hospital where the sick and injured are cared for must be under competent management in order that patients may have the best attention possible and that the employer may have the protection against the encroachment of shyster lawyers.

I am going to give you an outline of the system used by the Mississippi Southern Railroad and the Edward Hines Lumber Company, which I have the honor to serve as chief surgeon. To secure employment the man files his application at the general office of the company and he gives then a brief history of himself and his previous employment. This is recorded on one side of a card and the other side of the card is used for recording his medical examination. If his application is approved at the office for employment, he is then referred to one of our physicians, who makes a thorough physical examination. If he is physically fit, he is given an okay and returned to the office for his work card. In making these examinations, there are certain physical defects which we consider disqualifying, namely: poor vision, deafness, the loss of a leg or arm or parts of same which would give him a handicap, tuberculosis, any kind of hernia, hemorrhoids, varicosities, and any active venereal diseases. All minor defects, though not disqualifying, are recorded on the examination card in order that the company may be protected should any of these later become active and the employee claim the company liable. These examination cards are filed for permanent record. If an employee leaves the service of the company, even though for one day only, he is required to report back to the surgeon for examination before re-employment. An employee may be ordered up for re-examination when he is suspected of being physically disqualified to fill the position which he is holding. If his work is satisfactory, he may be given employment in another department where he is physically fitted to work.

The Medical Department of the Mississippi Southern Railroad and Edward Hines Lumber Company consists of a 50-bed general hospital, a chief surgeon, four physicians distributed over the works, and three consultants. We have one nurse assigned to duty outside of the hospital. The doctors over the entire operation work in very close conjunction with the safety department. Monthly foremen's meetings are held at all headquarters and departments and either the chief surgeon or local

doctor attends these meetings. The accidents of the previous month are gone into and discussed as to what caused them and what could be done to eliminate further accidents of the same nature. Every foreman who is more than a quarter of a mile from a doctor's office, is supplied with a complete emergency kit and given instructions as to how to apply first aid. If an injury occurs and it is of sufficient seriousness in the opinion of the foreman, the man is immediately sent directly to the hospital without consulting the local doctor. If the injury is minor, he is given first aid attention and then referred to the local doctor. Every 90 days the foremen are brought together and given new methods of first aid and often compete in demonstrations of the best and quickest first aid given a serious injury. Our safety department is in charge of an engineer who makes a weekly inspection over all departments on every location that the company is operating. An active campaign was started on the Edward Hines Lumber Company works June 1, 1926, and as a result, a reduction of accidents of 15 per cent was accomplished after six months of safety work—that is, in 1926 over 1925. By an intensive safety program being put on over the entire works in 1927, the results show that the reduction in injuries, no matter how trivial, was 48.9 per cent over those of 1926. The reduction of lost-time accidents was 42.41 per cent. Where we used to have from 100 to 150 injuries every month, we are now having less than 20 per month, with the same number of men working under the same conditions, and not 1 per cent of these are serious injuries. Even with the low mark of 1927, the first four months of 1928 have shown a reduction of 75 per cent below those of the first four months in 1927. If the industrial surgeon on any works will work closely in conjunction with the foremen and have an understanding with them he will in a large measure share the reduction of accidents over his location. The foremen cannot do much unless the doctors back them up in their accident-prevention work. Every doctor on my location is backing the safety department 100 per cent, and, as a result, the above results have been obtained.

I find that most of my trouble comes from neglected minor injuries or those considered minor by the local physician. It has been my experience that neglected first aid to minor injuries causes a high percentage of serious injuries and converts what should not have been a lost-time accident into a lost-time accident; therefore, we must keep in behind those responsible for rendering first aid and see that these injuries are promptly cared for. For instance, a man gets a foreign body in his eye. The local surgeon examines it and thinks that he has removed it. The man returns to work and in two or three days he turns up with a much inflamed eye and has to go to the hospital where an roentgen-ray examination shows a piece of steel in the anterior chamber of the eye. The man develops traumatic cataract and loses his eye, the medical service is criticized, and the company pays out five or ten thousand dollars because of the failure of the local doctor to give serious consideration to all eye injuries even though they apparently be minor. All head injuries, even though they be simple, should be sent to the hospital for roentgen-ray examination. So many times we find a man who suffers a slight blow to the head and returns to work only to fall out and is then sent to the hospital where roentgen-ray examination shows a fracture. I recall one neglected minor injury case recently where a man working in the machine shops had a slight abrasion on one of his fingers and continued to work without calling for first aid until the day's work was done. He developed a severe infection and came very near losing his arm and is now suffering with a stiff hand and has been off duty for more than two months. If this man had gone to his first-aid kit and touched this wound with iodin and applied a bandage, he would not have developed infection.

At this point, I wish to pay my respects to the insurance feature in accident work. I find where a man or corporation is carrying insurance for employees that it will require three times longer to cure him than it does the man who has no insurance. Then we have to deal with the malingerer, who, with the slightest injury, will claim internal injury and, regardless of treatment, just won't get well.

In conclusion, the careful selection by the foremen of the employees and the thorough physical examination by the physician will aid materially in reducing accidents and the prevention of law suits. The whole-hearted co-operation of the surgeon with the safety department and with the foremen will reduce the lost-time accidents and also the surgeon's work. The attitude of the employer to employee is of the greatest importance—that is, the employee must have confidence in the employer, feeling at all times, that he will get a square deal when sick or injured (this confidence we have in our organization). And immediate attention to all injuries, no matter how trivial, will reduce the time of lost-time accidents to the minimum.

CLINICAL EXPERIENCE WITH IRRADIATED ERGOSTEROL—It is the opinion of Alfred F. Hess and J. M. Lewis, New York, that irradiated ergosterol is by far the most potent of the antirachitic agents. It is an absolute specific. Cod liver oil in the amount in which it can be given is a specific of limted dependability—only moderately effectve for the average infant, uncertain in action for the rapidly growing infant, and ineffective for the premature. Irradiated ergosterol is quite as valuable in tetany as in rickets, and in both disorders is remarkable for the rapidity as well as for the reliability of its action. As yet, however, no sufficient clinical experience has been had to define its proper dosage. Furthermore, the various preparations cannot be evaluated, as they have not yet been assayed on the basis of the number of "curative units (rat)" which they contain. The amounts now recommended and employed are unnecessarily high, as shown by the fact that they induce an excess of calcium and inorganic phosphorus in the blood in the normal as well as in the rachitic infant—hypermineralization.—Jour. A. M. A., 91:-783-788, 1928.

SPINAL ANESTHESIA.*

J. K. AVENT, M. D.,

GRENADA, MISS.

In presenting this paper for your consideration, no attempt is made to add anything new in the way of anesthesia. That major surgical operations under spinal anesthesia have long ago ceased to be experimental procedures can not be denied.

I shall not urge you to use spinal anesthesia for its use may bring you criticism and worry. The easy path is the well trod path. But I should like to show if you care to take the trouble to master the technique you will have at command in its field, the safest anesthetic, the quickest anesthetic, the most relaxing anesthetic of which we have knowledge. But you will assume more personal responsibilities and will incur some criticism from the doctors, not the laity. Those who use it are ardent admirers of spinal anesthesia. If you have never operated with spinal anesthesia, you do not know what perfect relaxation is. The first time it is used, you will immediately say it is the ideal anesthetic.

HISTORY.

Dr. James Leonard of New York did the first experiments of spinal anesthesia in October, 1885. Dr. Augusta Bier first used it in surgical cases on man by experiments upon himself and associates. Deaths were soon reported because of the uncertain and toxic effects of cocaine and the method lost favor everywhere.

PHYSIOLOGICAL ACTION.

Transient root interruption is the physiology. Blocking of posterior roots occurs with consequent analgesia and loss of tactile, muscle and temperature sense. The anterior roots with the associated white rami communicantes are also blocked, causing transient motor paralysis and, especially important, transient vasomotor paralysis. The posterior root block is

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essential, that the operation may be painless; anterior root interruption is desirable that the operation may be done with the ease and facility that complete muscular relaxation affords. The interruption of the white rami, while it reduces bleeding and favors intestinal contraction and peristalisis, leads to a slowing and weakening of the heart action and a fall in blood pressure that may be hazardous. As the white rami through which the sympathetic impulses are conducted to the entire body are associated only with the anterior roots from the second dorsal to the third lumbar, it is evident that, if the anesthesia involves the lower lumbar and sacral roots, there will be little or no effect on the blood pressure, but if the fibers supplying the great splanchnic vessels and those of the upper part of the body are effected, a great fall in blood pressure results. A blood pressure fall of twenty to thirty milimeters is moderate, while thirty to fifty is not unusual, and a fall in the systolic in the radials to zero is occasionally seen. This fall in pressure which usually lasts but from fifteen to thirty minutes, may be combatted by introducing fifteen minims of the solution of adrenalin chloride, 1-1000, intravenously. Its action here is almost a specific.

Some of the operations that may be performed with spinal anesthesia are: thoracotomy, gall bladder work, Caeserian section, amputation of the hip, and setting of bones of the lower extremities.

TECHNIC.

The point of injection is figured out according to the operation. You may go as high as the space between the 11th and 12th thoracic. As a rule you need not go higher than the 12th thoracic and first lumbar. Most cases will give complete anesthesia between the 1st and 2nd lumbar. The skin is injected with 1 per cent novocain, and the spinal needle passed with as little trauma as possible. When you get clear spinal fluid draw from 2 to 6 c.c. fluid, mix this with apothesin, or novocain, then inject this back into the spinal canal. Do not pump your fluid back and forward in the syringe, if you do you are more apt to push it too far up the spinal canal. You can have the patient either in the sitting or lying position. As a rule your anesthesia is immediate and you are ready for work. Sometimes lowering the patient's head will assist you in more complete anesthesia. I always have the nurse keep her finger on the patient's pulse for the first ten minutes, and she has adrenalin ready if it is necessary. It is seldom needed. I now give 50 mg. of ephedrin sulphate subentaneously 20 minutes before the spinal puncture. The action of ephedrin in spinal anesthesia is very similar to that of adrenalin, but is very much more prolonged. Its effects are produced by stimulation of the sympathetic nervous system, and are produced peripherally and not centrally. The rise in blood pressure is due to vasoconstriction and cardiac stimulation. Ephedrin also stimulates the stellate ganglia. With ephedrin, a greater proportion of the rise in blood pressure appears to be due to cardiac stimulation, than with adrenalin. While medicinal doses of ephedrin stimulate the heart, toxic doses depress it; and death is due to cardiac failure following clonic convulsions. Moderate doses sometimes cause extrasystoles, and acute cardiac dilatation. If the blood pressure has been lowered by the spinal puncture, the rise is less pronounced and the heart is more susceptible to the depressing action. Ephedrin dilates the pupils and relaxes the bronchial and intestinal muscles. With repeated doses the effects are cumulative, and tolerance is not established. There is a wide margin of safety in dosage, as the lethal dose is 35 to 100 times the physiologic dose. It may be given intravenously, subcutaneously, or by mouth. The effect is the same, but progressively slower and less intense by the last two methods. The similarity of ephedrin to adrenalin in action—the vasoconstriction, the marked

cardiac stimulation with the pronounced rise in blood pressure, and the fact that it acts peripherally and therefore is effective during the paresis of spinal anesthesia—at once suggests its use to counteract the fall of blood pressure in this anesthesia.

DISADVANTAGES.

1. It may require resuscitation measures which should be at hand.

2. Certain patients are bad risks, notably those in shock or collapse, low blood pressure (systolic below 100), and those with pleural effusions or new growths.

3. Obese and elderly patients have a greater fall in blood pressure.

4. Not being a method of universal use it invites criticism.

5. No absolutely safe drug for spinal anesthesia has yet been found.

6. Neurotics may blame some of their post operative symptoms on spinal anesthesia.

ADVANTAGES.

1. Perfect and complete anesthesia in nearly all cases.

2. The bowels become flat and lose their tendency to crowd the operative field, which is a most precious symptom.

3. Produces a negative abdominal pressure so you can easily explore the entire abdominal cavity. (In peritonitis quite often the relaxation from the anesthesia will cause the patient to have an evacuation of the intestinal tract while patient is on the table.)

4. Less bleeding due to fall in blood pressure. Hemostasis must be perfect.

5. Normal diet restored earlier.

6. Rarely vomiting and no gastric disturbances, no lung and kindney complications.

7. The sutures are left undisturbed and produce a neater scar.

8. Spinal anesthesia simplifies surgery by establishing the most favorable condition for clean operation and reducing to a minimum the operative and post-operative risk.

9. Cheapens and reduces operating room work at time of operation at least 20 per cent.

10. The ideal anesthesia for tubercular patients who do not have a low blood pressure.

11. Rarely is it contra-indicated in kidney and heart disease. It is especially of value in high blood pressure patients.

12. It is more reliable than this paper would lead you to believe.

13. It is not new and will stand any law suit.

14. Hastens the operation

DISCUSSION.

Dr. S. W. Johnston (Vicksburg): I enjoyed this paper very much and I would like to suggest a preparation that we have been using the last two or three months that has given perfect satisfaction. The preparation contains 195 milligrams of novocaine, 3 drops of starch water, 1/30 grain of strychnin, 3 drops of alcohol and 2 to 3 drops of 1 per cent solution of ephedrine sulphate in 2 c.c. of normal salt solution. We used a long needle of 18 to 22 gauge with a very obtuse bevel. The specific gravity of the spinal fluid is almost exactly the same as this solution. We have never had any bad effects from it. It does not lower the blood pressure and the absence of shock is very noticeable. We draw off about 3 c.c. of the spinal fluid first, then draw 3 c.c. into the syringe with the novocaine mixture, gradually injecting it into the canal. The strychnin combined with the ephredine sulphate prolongs the anesthesia as well as prevents the lowering of the blood pressure. Ephedrine has an advantage over adrenalin in that the effect is more lasting.

Dr. H. A. Gamble (Greenville): I do not like to take the floor again, but our experience with spinal anesthesia has not always been as favorable as the reports this evening would indicate.

We have oftentimes had a rapid drop in blood pressure, to such an extent that it verged upon the danger line. We have never used the preparation which Dr. Johnson has suggested, but in

order to counteract or prevent this rapid fall in blood pressure, we employ the method which Babcock of Philadelphia brought out a few years ago; that is, we have an assistant who watches the blood pressure, and gives intravenously as necessity indicates a solution of adrenalin chloride (20 minims for each 200 c.c. of normal salt solution). In this way we have been able to control the blood pressure, but I have never been convinced that there is not considerable danger attendant upon the use of spinal anesthesia.

Dr. J. K. Avent (closing): Dr. Johnston referred to the strychnin and the starch. Dr. Culley had me to get some of that a few days ago and it works beautifully, but there is a preparation put out by Metz and Company which contains the starch, novocain and alcohol, and I think if Dr. Gamble uses that he will find it a very good preparation, especially if he will use ephedrin sulphate. This is a big subject, and I believe the time is coming when every one of us will use it more than we are using it today.

TECHNIC FOR CLINICAL BLOOD PRESSURE MEASUREMENTS.

CLYDE BROOKS, M. D.,†

UNIVERSITY, ALABAMA.

For clinical measurement of blood pressure the auditory method is the method of first choice, at the present state of our knowledge. Using the auditory method, and the Riva-Rocci instrument, or some improvement of this apparatus, the correct criterion for securing the so-called systolic blood pressure measurement is the point where the arterial sounds first appear when the pressure in the cuff is gradually lowered, after first having been raised to a point high enough to suppress all arterial sounds.

Then continuing gradually to allow the pressure in the cuff to fall, until all arterial sounds cease, brings the pressure to the correct point for reading the so-called diastolic blood pressure.

Neither of these two readings represents the true diastolic nor the true systolic blood pressure. But they are readings of two factors: first, the blood pressures; second, the additional pressure necessary to collapse the artery on which the readings are made. The principle on which the second factor is based is generally mentioned in the literature on blood pressure, though not generally well understood. But the greatness of the error due to the added elevation of pressure readings caused by this factor, is not at all generally appreciated.

To study these problems, a simple physical model was made of a piece of soft, thin-walled, rubber tubing, mounted within a large glass tube, so arranged that the inside of the piece of rubber tube was connected with a pressure bottle, and the space surrounding the soft rubber tube (and within the glass tube) was connected with another pressure bottle. The whole system was filled with water. One mercury manometer was connected with the space inside the soft rubber tube, and another manometer with the space outside the soft rubber tube (and within the glass tube). The pressures in these two openings were recorded on a kymograph.

In this physical model the piece of soft rubber tubing represents an artery on which the blood pressure readings are to be made. The pressure bottle connected with the inside of this arterial tube may be raised and lowered, thus producing the pulsating changes in pressure representing the systolic to diastolic blood pressure. The outer glass tube surrounding the arterial soft rubber tube, represents the cuff or arm band. By raising the pressure in this tube (which is outside the arterial rubber tube), pressure is brought to bear on the outside of the arterial tube. With this model it is found, that by setting the outside pressure at the right point, the arterial tube is collapsed just at the point where the inside arterial pressure is just at the diastolic level. Then by raising the arterial pressure to the systolic level, the arterial tube opens and fills with fluid.

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This adjustment gives maximal pulsations which are recorded by the manometer connected with the outside or cuff pressure. This result is contrary to the prediction of Marey (known as Marey's principle) which stated that maximal oscillations should be transmitted when the outside (cuff) pressure is just equal to the diastolic arterial pressure. Marey did not test his theory by a physical model.

Another principle demonstrated on this model is that the outside (cuff) pressure must be raised some three feet above the level of the inside (arterial) pressure in order to collapse the arterial tube which was used in this particular model. This is surprisingly high in view of the fact that the arterial tube is very soft and much larger in diameter than any human artery. (It has been found that the larger the diameter of the arterial tube, the less outside pressure is required to collapse it.) All this shows that this factor, or error, in measuring the blood pressure in patients with rigid blood vessels, must be very great.

Another principle shown by experiments on this model is that the oscillatory method for measuring blood pressure is not a good method. For the point where oscillations begin to be transmitted from the inner arterial pulsatory waves, is high above the systolic level. The height at which they may first be seen is determined by the delicacy of the recording apparatus. Naturally this leads to the conclusion that attempts at measuring blood pressure by the Uskoff, or any other of the various elaborate complicated oscillatory devices, are founded upon a misunderstanding of the physical principles involved in the use of these machines.

On the other hand, the auditory method depends upon the production of arterial sounds by pulsations of the blood pressure which impinge upon the cuff from above, and which finally open the artery from above downward. This sudden onset of opening and closing of the artery is accompanied by the sudden onset of sharp, high-pitched, snapping sounds, or thumps. This does not mean that the pulse wave is passing through under the cuff; but that it is merely opening the vessel under the cuff, and the opening, or rather the sudden closing, produces the sounds. These sounds may be imitated by tapping the tragus of the ear with the fore-finger. As the pressure in the cuff is further gradually lowered, these sounds gradually become lower in pitch and softer in tone, until they suddenly cease. The point where they cease is where the artery is not any longer completely collapsed, even at the lowest point of diastolic pressure. This is the point for reading off the diastolic pressure. At a point somewhat below the systolic pressure, there suddenly appears sharp, nozzle-like murmurish sounds immediately following the thump sounds, and in fact joined directly to the last part of the thump, making a "thumpish-sh." This sound may be imitated by tapping the tragus of the ear, and immediately dragging the finger at the instant it strikes the tragus. The nozzle, murmurish quality of the sounds is produced by the pulse wave breaking through under the cuff, and moving on below it. Because the artery is flattened, and only opens slightly it makes a narrow slit through which the blood must pass. This causes the nozzle-like sounds. They have no significance in blood pressure readings, and should therefore be ignored in such readings. Ordinarily there

are no other sounds nor phases of sounds to be heard. Furthermore, Korotkov never described the various phases of sounds, which are commonly described as "Korotkov's sounds."

The readings which are made: the highest point where arterial sounds are heard (the systolic blood pressure); and the lowest point where arterial sounds are heard (the diastolic blood pressure) are valuable clinical readings, although they do not correspond to the true systolic nor the true diastolic blood pressures. They are readings which are above the true levels of the systolic and diastolic pressures. The amount of error depends upon the resistance of the artery to compression. However, for the sake of uniformity, it is recommended that these measurements be made as suggested above, and that they be called systolic and diastolic pressures, with the understanding that they are not the true pressures; but are readings of blood pressure plus arterial resistance. As such, they are valuable clinical findings.

DISCUSSION.

Dr. R. H. Turner (New Orleans): I am sure we are all greatly indebted to Dr. Brooks for this presentation. Everyone has experienced some confusion about the sounds which indicate correctly the systolic and diastolic levels of blood pressure. The medical profession is to be congratulated on having a man who has the ingenuity and the patience to prove what relationship exists between such things as sounds heard with the stethoscope below the pressure cuff and the blood pressure. Although he can not hand us a perfect method for determining blood pressure, he can tell us the most satisfactory reading to make.

There are many people who wish to read the diastolic pressure while the sounds are still being distinctly heard on account of a change in their character. The greatest variety of new sounds may be heard in different cases, and several changes may take place. If one seizes upon the wrong change, the diastolic pressure may be read too high. The diastolic pressure is, of course, of tremendous clinical importance, probably of greater clinical importance than the systolic pressure. Dr. Brooks has shown that the most accurate diastolic reading may be made at the time the snapping sounds disappear as pressure in the cuff is allowed to drop.

I think there is one condition left which may still demand the palpatory method of determining blood pressure, a rather rare condition most of us have seen only once or twice. This is the ausculatory gap. It may lead us into error if we use the ausculatory method alone. These people, often with hypertension, exhibit a most peculiar phenomena in that there is a period when the sounds should be loudest that they are inaudible. Sounds are heard below the systolic and above the diastolic levels, but with a silent gap between. If one does not happen to start with a very high pressure in the cuff, only the sounds below the gap may be heard, and the systolic pressure read as 150 when it really is 220. It is not a bad idea to check the systolic level by both the ausculatory and palpatory methods.

Dr. Brooks (Closing): I appreciate the remarks of the doctor who has discussed my paper. There is just one point that I would mention here, and that is: when one reads the blood pressure of a person with arterio-clerosis there is a high reading which may be blood pressure plus resistance of the vessel. It is important to know that. There is no way of teiling by merely reading the blood pressure whether it is actually high pressure, or whether the pressure is normal, and the arterio-sclerosis runs the pressure reading up.

I am not ready to say, anything as far as I know, about these cases where there is a gap in the pressure sound. I do think that the palpitory method should be used in these cases; but as to why there is this gap, I am not, at present able to understand.

Another type of case is where the arterial scunds continue on down to a very low point. I am not ready to make a statement regarding these cases; but I suspect this sound curve in such cases, is due to another factor. In other words, the sound may be a different sound, not produced by the mechanisms that produce the regular sounds.

CASE REPORTS AND CLINICAL SUGGESTIONS

PROGRESSIVE NEURAL MUSCULAR ATROPHY (PERONEAL TYPE).

(Clinical Report of Two Cases in Brothers, Associated With Mental Symptoms).

W. J. CAVANAUGH, M. D., and HYMAN TUCKER, M. D.,

MERIDIAN, MISS.

Many cases of the peroneal form of muscular atrophy have been previously reported, both singly, in more than one member of the same family, and in more than one generation. However, in a fairly extensive search of the literature, the authors found but little reference made to concomitant mental symptoms.

This peroneal type of atrophy was originally most accurately described by Charcot, Marie, and Tooth, and seems to stand midway between the central muscular atrophy and the muscular dystrophies. It usually begins early in life, runs in families, and attacks the muscles of the feet and peroneal group—later to be followed by involvement of those of the hands and upper limbs. Double club foot, the characteristic "steppage" gait, sensory and electrical changes are common. The course is a chronic one.

Practically nothing new has been added to our knowledge of this type of atrophy in the last 30 years, except possibly some light concerning its familial and pathological characteristics. Macklin and Bowman[1] studied this disease in a family of 101 persons, 21 of whom were affected in 5 generations. They concluded that:

1. The disease was not transmitted by persons who did not have the disease, manifest or latent.

2. It is possible for persons who have not yet shown the disease to procreate offspring to whom they transmit it, even being possible for the parent to transmit it to the child and for the parent to die before developing the disease.

3. Males and females were equally affected and probably transmitted it equally.

4. The longevity was not affected by the disease.

Pathologic-anatomic investigations[2] have shown that there is a degeneration in the posterior columns resembling that of tabes dorsalis, and atrophy of the anterior cornual cells, while the anterior nerve roots are said to be healthy; and a marked degeneration in the muscles fibres and intramuscular nerve fibres of the affected muscles.

The following rather typical cases of two brothers were studied during their hospitalization for mental trouble at the East Mississippi State Hospital. To obtain an anamnesis it was necessary to drive 75 miles into the country. Here the father of the two boys was interviewed. We found him uneducated, but of average intelligence. He himself was an orphan and knew nothing of his parentage. He gave the history of his wife's ancestors as negative, though it was noticed that his wife, the mother of the cases here reported was grossly defective, probably a high grade imbecile. He was unable to give a definite history about his own children, stating that being accustomed to them he had paid little attenion to their early development. Besides the two boys J. D. and J. E., there were eight children. Three boys—ages 25, 21, and 17 years——are living. The two older boys were not seen but were said to be normal mentally and in good health. The younger appeared to be defective mentally and the father stated he could never learn at school and could not do anything but the simplest farm work. The oldest boy died suddenly at the age of 27 years—was normal mentally and there was no definite physical ailment noticed prior to his death. Three girls living. One—age 37 years—the oldest child, had the appearance of a low grade imbecile. She could do only the simplest house work, and it was noticed that she could not dress herself properly. Her clothing were ill arranged and the right shoe was on the left foot. She was at times irritable, but as a rule was easily managed. Another, age 19 years, was considered normal in intelligence by her father, though appeared dull. She was anemic and had complained of sick headaches and swelling of the feet for the past month or more. The youngest living child, a girl age 12 years, was in good physical health and appeared bright mentally. One girl died in infancy—cause unkown.

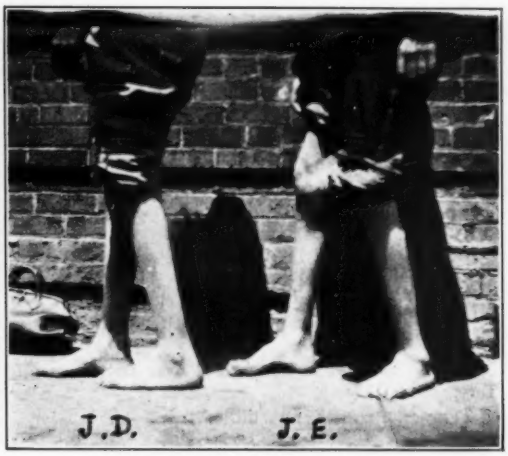
Personal History. J. D.

Age 30 years. Birth and childhood normal. Walked at the age of one year and talked at the usual age. Was bright and attained the 7th grade in school. No history of acute illnesses. It was noticed in early childhood that he developed a peculiar gait—"high stepping" as informant called it. This gradually grew more pronounced, though did not interfere with his work. Was considered normal mentally until 1919. Became irritable and attempted suicide. Was committed to East Mississippi State Hospital June 24, 1920. Was discharged as improved August 14, 1920. At home he was extremely irritable and unruly; would mumble to himself; get up at all times of the night and constantly abused his neighbors verbally, though made no attempts to injure anyone. Was recommitted to the hospital March 26, 1921, where he has been continuously since.

Personal History. J. E.

Age 25 years. His father thought that his feet were out of shape at the time of birth (not certain of this however). Otherwise birth was normal. Walked at the age of two years. Is unable to give age at the time of teething or talking. Had measles and whooping cough at about the age of 9 or 10 years. His general physical health was delicate. Was also dull mentally from early childhood. Could not learn in school, reaching the third grade at the age of 15 or 16 years. Was never able to do any kind of farm work that required any degree of skill. Was never as dependable and was more unruly than J. D. At the age of 22 years suffered from an attack of typhoid fever and was delirious for several days. Escaped from his home in his night clothes and remained out in a rain all night. Following this was very unruly and obstinate. Would lie in bed and threaten his neighbors. Would get up in the middle of the night to feed the farm stock and throw feed all over the barn yard. His manner became so threatening that he was committed to the East Mississippi State Hospital February 27, 1927. It was noticed that he walked with more and more difficulty during the year prior to his admission.

1. Anterior view of lower extremities



2. Lateral view

GENERAL PHYSICAL EXAMINATION.

Both are fairly well nourished; J. E. 24 years old; height 5 feet 8 inches; weight 140 pounds. J. D. 30 years old; height 5 feet 8½ inches; weight 146 pounds. They stand with knees slightly flexed —feet wide apart. The condition seems much more advanced in the younger one.

J. E.: Definite atrophy of supra and infra-spinatous muscles on both sidees; also decided atrophy of interosseus muscles of both hands with slight tendency to claw shape. Both feet assume varus position—are characteristically claw shaped with short high arch—more prominent on right side. All toes are flexed. He bears weight on outer plantar surface. Atrophy is most marked in both legs and feet.

J. D.: No appreciable atrophy of supra or infra-spinatus on either side. Shows slight atrophy of interosseii of both hands. No claw tendency. Feet assume slight varus position. Claw shape is present, but not pronounced—more marked on left foot. Stands like J. E.—feet not so far apart. Atrophy of leg muscles very distinct, but those of feet only moderate.

Tonsils: Cryptic and infected.
Mouth, Neck, Ears and Nose: Negative.

Lungs and Heart: Negative. B. P. 110/70. Pulse 70.
Genitals and Abdomen: Negative. No evidence of endocrine disturbance.

Tonsils: Cryptic and infected.
Mouth: Third molars on each lower side absent. Also upper right third molar and second premolar, first upper left premolar, and first upper left molar. All molars except upper right side have been filled.
Neck, Ears and Nose: Negative.
Lungs and Heart: Negative. B. P. 110/70. Pulse 80.
Genitals and Abdomen: Negative. No evidence of endocrine disturbance.

NEUROLOGICAL.

Eyes: Vision impaired. Extrinsic muscles O. K. Fundus shows double optic neuritis, more pronounced on right.
Visual Fields: No co-operation. Pupils equal, regular, and react to light and accommodation. Consensual and cilospinal reflex normal.
Cranial Nerves—Smell, Hearing and Taste: Normal.
Tongue: O. K. Few tremors.
Gait: Steppage—waddling.
Subjective: Complains of hot sensations in feet and legs—only when sitting down.

Eyes: Vision good. Extrinsic muscles O. K. Fundus examination negative.
Visual Fields: No co-operation Pupils equal, regular, and react to light and accommodation. Consensual and cilio-spinal reflex normal.
Cranial Nerves—Smell, Hearing and Taste: Normal.
Tongue: O. K. Few tremors.
Gait: Steppage—waddling.
Subjective: Both lower extremities feel numb and warm.

REFLEXES.

Superficial: All present except—
(1) Abdominal seems more active on left side.
(2) Plantar response is absent on both sides except concomitant contraction of tensor fasciae femoris.
Deep Reflexes: All present except knee and ankle jerks, which are absent.
Organic, Rhomberg and Co-ordination: Normal. No speech defect.

Superficial: All present.
(1) Epigastric, abdominal, and lower abdominal all much increased on left side.
(2) Tensor fasciae responds, but no flexion of toes. Oppenheim and Gordon—give no response in either case.
Deep Reflexes: All present except ankle jerk. Knee jerks equally present and normal.
Organic, Rhomberg and Co-ordination: Normal. No speech defect.

SENSATIONS.

Not able to co-operate fully.
Touch: Absent on plantar surfaces of both feet. Markedly diminished on both lateral sides of feet.
Pain: Present but impaired over both legs and feet.
Temp: Present, but dulled.

Muscle Sense: Good.
Deep Pressure Sense: Present.
Stereognosis: Normal.

Co-operates better. Higher I. Q.
Touch: Practically the same as brother.

Pain: Impaired, but present.

Temp: Responds more promptly. Normal on both legs. Reaction time is increased on feet. No sensations for cold on plantar surfaces of both feet.
Muscle Sense: Good.
Deep Pressure Sense: Present.
Stereognosis: Normal.

SPECIAL MEASUREMENTS.

Head: 21¾ inches in circumference.
Chest: 34½ inches.
Right Arm: 10½ inches.
Left Arm: 10 inches.
Right Forearm: 9¾ inches.
Left Forearm: 9¼ inches.
Right Thigh: 17¾ inches greatest circumference, 4 inches above patella 13½ inches.

Head: 21¾ inches in circumference.
Chest: 36 inches.
Right Arm: 10½ inches.
Left Arm: 10½ inches.
Right Forearm: 9½ inches.
Left Forearm: 9¾ inches.
Right Thigh: 18¾ inch greatest circumference, 4 inches above patella 14 inches.

Left Thigh: 17½ greatest circumference, 4 inches above patella 13 inches.
Right Calf: 9¾ inches at greatest circumference.
Left Calf: 9½ inches at greatest circumference.
Right leg above ankle: 6¾ inches.
Left leg above ankle: 6½ inches.

Left Thigh: 18½ inches greatest circumference, 4 inches above patella 14 inches.
Right Calf: 10 inches at greatest circumference.
Left Calf: 10¼ inch at greatest circumference.
Right leg above ankle: 7½ inches.
Left leg above ankle: 7½ inches.

LABORATORY DATA.

Blood Wassermann total and differential blood counts and blood sugar negative.
Urine and Spinal Fluid: Normal.
Mental Status: Passive and agreeable. No spontaneity. Inattentive when questioned and answers are rambling. Takes ordinary care of person, but shows little interest in surroundings. Orientation approximate for time and place; good as to person. In fair contact. Memory good for recent, but poor for remote occurrences. Mood changeable. Inadequate emotional reaction.
Intellectual: Unable to give a satisfactory account of the difficulties leading up to his commitment. No hallucinations or delusions. Complains of peculiar sensations in legs when sitting down. General mental grasp is practically nil. Is unable to do the simplest calculations. Has practically no school or general information. A psychometric examination shows a total mental age of 6½ years with an I. Q. of 40. No insight. Judgment and reasoning in keeping with mental age.

Diagnosis: Mental deficiency, probably with periods of excitement.

Blood Wassermann total and differential blood counts and blood sugar negative.
Urine and Spinal Fluid: Normal.
Mental Status: Passive; seclusive; no spontaneity; inattentive. Answers questions relevanly. When left alone will mumble and laugh to himself. Shows little interest in person and surroundings. Orientation and memory fairly good. Mood apathetic and retiring. Emotional reactions inadequate. Emotional tone lowered.
Intellectual: Is shut in and will not give satisfactory account of his difficulties. Has a good many paranoid ideas unsystematized. Will not admit hallucinations, though spends much of his time talking when alone. General mental grasp considerably below 7th grade; however, he does small problems correctly. Apparently has retained only a small part of school knowledge. This may be due to lack of interest and co-operation. Practically no general information. Psychometric examination shows mental age of 9 years, 8 months, with an I. Q. of about 60. His answers during the psychometric examination were scattered. He failed on tests in the 6th, 7th, 8th, and 9th year, but did much better in the 10th. Did not completely fail until after the 14th year. The mental age of 9 years, 8 months, is out of keeping with the attainment of the 7th grade in school and indicates more a deterioration than a native deficiency.
Diagnosis: Dementia precox (Hebephrenic type).

SUMMARY AND DISCUSSION.

We have presented two rather typical cases of peroneal atrophy in brothers, where hospitalization was the result of the development of mental symptoms. We feel that these latter were probably purely coincidental, since they fell into definite psychiatric groupings. It would be interesting to be able to get the brains and spinal cords of these cases, but this is unlikely. A striking resemblance was noted in the heights and weights of these boys, although a difference in age of six years. Both their head circumference and blood pressures were identical. From the clinical standpoint, the younger boy showed more advanced symptoms and this was corroborated by the neurological findings.

We note that the heredity is badly tainted in the family, although the older of the two boys, J. D., was considered normal mentally, having reached the 7th grade (an average for this part of the country), while J. E. was always below par mentally.

1. Macklin, Madge Thurlaw and Bowman, J. Thornley. The inheritance of peroneal atrophy; incidence of the condition in five generations: J. A. M. A., 86; 617, 1926.

2. Stewart, Purves: The diagnosis of nervous disease, Sixth Ed., p. 306.

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THE PHYSICIAN AND JURY DUTY

From time immemorial the physician has labored under the belief that he is positively exempt from jury duty. Recently in several states there has been made an effort by jurists and sheriffs to oblige doctors to serve on juries. This attempt in the face of a precedent long sanctioned by time, is possibly in many states as no specific legislation has been enacted freeing the physician from a civic duty which could be performed only at the expense of the sick. In Louisiana, however, such is not the case. President J. Birney Guthrie of the Orleans Parish Medical Society has consulted the attorneys of the Society, Messrs. Dart and Dart, who state specifically, "that Act 154 of 1926 exempts all physicians and surgeons who are actively engaged in the practice of their professions, from jury service."

This legal opinion on the status of the physician in reference to jury duty, obtained primarily for the members of a local branch of the State Society should be appreciated by all the members of the organization. Such positive information on this point may prevent considerable trouble and disagreeable argumentation in the future, if, perchance, a Louisiana physician should be called to act as a juryman.

BRUCELLA MELITENSIS VAR. ABORTUS INFECTION IN MAN.

In the past few years certain of the hitherto unrecognized infections such as typhus fever have been shown to be more or less prevalent in certain communities. New infections have been recognized, a notable example of which is the discovery of tularemia, largely through the efforts of Francis. Malta fever represents a disease which was not believed to be prevalent in this country, but which now is known to exist in certain section of it. Closely allied to this interesting disease from the point of view of the bacteriologist and clinician is infection in man by the organism responsible for infectious abortion in cattle. This disease is being recognized throughout the country and so far some thirty-six cases have been reported. That this represents the true incidence of the disease is very doubtful, as agglutination reactions in a large series of individuals whose sera were being examined

by the technic of Wassermann, made in such states as Illinois, District of Columbia, Iowa and Tennessee, were positive in approximately one per cent. Kern* in a very clear and well presented review of the subject, calls attention to many points which space will not allow to be discussed at present. However, it would seem well to accentuate succinctly the clinical picture. These patients have at the onset vague irregular symptoms suggesting a general infection. The onset is usually insidious and the further clinical course is not characteristic, although there may be waves of pyrexia with succeeding afebrile periods simulating at times the septic type of temperature. This irregular fever is accompanied by severe sweats and vague nervous symptoms. Examination of the patient discloses some enlargement of the spleen in about forty per cent of cases. The blood pressure is usually low and the leucocyte count is usually under ten thousand with a relative increase in lymphocytes.

With this extremely indefinite clinical picture, needless to state, the disease is not suspected in a majority of cases or only until it has progressed over a long period of time. The agglutination reaction gives positive information, but has not been employed until the late stages in the course of the disease. It would behoove the physician, given a case of fever of undetermined origin lasting more than twelve days, to make use of this particular specific reaction. It is quite possible that it may clear up the diagnosis of a case of Brucella abortus infection unsuspected and unappreciated.

*Kern, Richard A.: Clinical Aspects of Brucella Melitensis var. Abortus Infection in Man: A Report of the First Cases Recognized in Pennsylvania, Am. J. Med. Sc. 176:405-430 (Sept.) 1928.

A NEW PARASITOLOGIST IN LOUISIANA.

All observers are enthusiastic and emphatic in the opinion as to the importance of New Orleans as a great medical center, and that the possibilities for its development along medical lines are unlimited. Because of its location and its proximity to the Latin-American countries, the field of tropical medicine is attracting more and more attention here. The establishment of the Department of Tropical Medicine of Tulane University, under the world renowned Dr. Castellani was rightly heralded as a great step forward both in the life of the University and the progress of New Orleans.

In keeping with the advancement of this newest department of the University comes the recent announcement that Tulane is to have an authority upon parasitology, namely, Dr. Ernest Carroll Faust.

Dr. Faust has had unusual experience in his specialty. He has worked and studied in French Indo-China, the Phillippines, the Malay States, Japan, Korea, Formosa, India, Egypt and Europe, as well as in the Southern part of the United States.

The newly appointed Professor of Parasitology was born in Carthage, Missouri in 1890. He has the degree of Bachelor of Science, Master of Arts, and Doctor of Philosophy. He is the author of many scientific publications. He is a councilor of the American Society of Parasitologists and a member of the permanent Commission on Parasitology of the International Congress of Zoology.

The Journal wishes to take this opportunity to welcome Dr. Faust, and to congratulate Tulane upon securing him.

LOUISIANA STATE MEDICAL SOCIETY NEWS

H. Theodore Simon, M. D., Associate Editor.

ANNOUNCEMENT.

TO THE MEMBERSHIP:

Arrangements have been made with the Roosevelt Hotel for the meeting of the Louisiana State Medical Society to take place next April.

The Roosevelt Hotel will be our headquarters where scientific sessions and the House of Delegates will meet.

Provisions have also been made for registration, scientific and commercial Exhibits.

PAUL J. GELPI, M. D.,
Chairman, Arrangements Committee.

THE PAN-PACIFIC WOMEN'S CONFERENCE.

The first Pan-Pacific Women's Conference was held in Honolulu August 9th to 19th. The conference was called by the Pan-Pacific Union for the purpose of bringing together women leaders in the Pacific countries to consider the problems of health, education, industry, social service, and government as they affect women and children in the countries of this area where live more than half the population of the entire world.

The meetings were held in Bishop Hall, Punahou School, and were presided over by Jane Addams, the International Chairman. Governor Wallace R. Farrington greeted the delegates in the name of the Territory and as President of the Pan-Pacific Union. Alexander Hume Ford, Director of the Pan-Pacific Union and one of the most indefatigable workers toward the success of the Conference, presented the "gavel."

Twelve countries were represented and of the 135 voting delegates 16 were physicians from China, Japan, Hawaii, Australia, New Zealand, Philippine Islands, Dutch East Indies, and the United States.

Besides the general meetings there were special meetings and round table sessions. Formal addresses in several fields of general interest to the entire conference were prepared in advance and presented in the general meetings, to which the public was invited.

Some of the topics were "The Status of Preventive Medicine in China", "Special Trends in Family Relationships in the United States", "Industrial Hygiene in the Philippine", "The Prevention of Infant Mortality in Japan", "Child Hygiene in New Zealand", "The Social Significance of the Employed Woman", "The Legal and Political Relationship of Women in Japan", "The Development of Child Hygiene in California", and others.

Of special interest to the health section were the visits to Queen's Hospital, the Palama Settlement, and also to the Industrial School for Girls and the Salvation Army School for Boys.

The medical fraternity holds its regular meeting in the form of clinics at Queen's Hospital every Thursday morning. I was much impressed with the splendid presentation of cases and papers, the enthusiasm of the members and especially the promptness of attendance. One carries away the feeling that the members consider this Thursday morning an opportunity and a privilege not to be neglected or underestimated. Queen's is a 250-bed hospital situated in a tropical garden with long avenues of royal palms more than a century old, and great numbers of other magnificent trees of koa, banyan, monkey-pod, the flowering pink and yellow cassia, and poinciana. The building has wide "lanais" (galleries) and a roof garden and sun porch combined with beautiful blooming plants and vines all about—certainly a comfort and diversion for the afflicted.

In co-operation with the dental staff at Palama Settlement, the city's big community center, Dr. Martha Jones, formerly of Yale, is carrying on research in dental caries with special reference to the effects of diet which she has studied in lower animals over a period of several years. The work is being studied in the pre-natal clinics, as well as in children of the pre-school and school age.

At a dinner given for physicians, Dr. Nils P. Larsens, medical Director of Queen's Hospital, and Chairman of the Pan-Pacific Surgeons Congress, announced that this congress would meet in Honolulu August 15 to 22, 1929. The tentative program covers the different branches of surgery and from the list of names already received from many different countries the success of the conference is assured.

For the physician who is planning a few weeks vacation next summer, I can think of no place where he could combine a greater amount of pleasure and interest within such a short time. The climate is delightful, the scenery is beautiful and restful, and the hospitality of the people of Hawaii is unsurpassed, and there are no snakes on any of the islands.

I enjoyed the hospitality of Dr. and Mrs. Howard Clarke in their beautiful home and attended with them the 150th anniversary of the settlement of the islands, held in Kapiolani Park.

Dr. Clarke, Tulane '05, is engaged in nose and throat work. He extends the Hawaiian-Aloha to all Tulanians.

ELIZABETH BASS,
Delegate from the Medical Women's National Association.

SEVENTH DISTRICT MEETING

The Seventh District Medical Society held its Fall Meeting in the LaCombe Hotel, Opelousas, on Thursday, September 13, 1928.

With an attendance of 38 members and a number of notable guests, the meeting was called to order by President J. W. Faulk, of Crowley. The minutes of the previous meeting were read and approved. A letter from Dr. Wright, in which he announced a donation of $10.00 towards the defraying of expenses, was read.

A committee composed of Drs. B. A. Littell, chairman; T. W. Watkins and M. L. Hoffpaur, was appointed to draw up resolutions on the recent death of our beloved and distinguished brother member, Dr. E. M. Ellis of Crowley.

The question of the flagrant violation of the law by Miller of Jennings in his chiropractic practice, was discussed. Dr. Leon J. Menville, president of the State Medical Society, added that a campaign was being waged to prosecute such violators, but the obstacles confronted, particularly in court, were greatly deterring the dispensing of justice.

Upon proposing Crowley as the next meeting place, the motion was carried.

Dr. M. O. Miller of New Orleans commented on the laudable work of the past superintendent of Charity Hospital, Dr. Wm. W. Leake. Following Dr. Miller's expression of the splendid work of Dr. Vidrine, the present superintendent of the hospital, a resolution was adopted commending the manner in which he was conducting the work.

Upon motion the following guests were elected honorary members of the Society: Drs. Leon Menville, Lucian Landry, E. L. King and M. O. Miller.

Dr. Faulk reported that Dr. King would not be present because of an exigency in his practice.

The scientific program consisted of the following very enlightening papers:

"Septic Osteomyelitis of Rib, with Case Report," —Dr. M. O. Miller.

"The Management of Pre-eclamptic Toxemia and Eclampsia,"—Dr. E. L. King.

In the characteristic humor of Dr. Lucien Landry, under the title of "De Specialization of Medicine", he gave a resume of the practical phase of specialization, in the farcical French dialect.

S. R. HENRY, M. D.,
Secretary-Treasurer.

AMERICAN PUBLIC HEALTH ASSOCIATION MEETING.

Eleven sections will comprise the 57th annual convention of the American Public Health Association, which will be held jointly with the meetings of the American Child Health Association and the American Social Hygiene Association, October 15-19, at the Stevens Hotel. Sections will be divided into the following main groups: Epidemiology, Public Health Education, Cancer, Vital Statistics, Industrial Hygiene, Public Health Engineering, Child Hygiene, Laboratory, Health Officers, Food Drug and Nutrition, and Public Health Nursing.

Convention discussions will be followed by laboratory trips, or inspection tours. Eighteen scheduled trips have been planned, and sixty-three optional ones are on the program, so that these tours will offer a wide range of interest and be of value to workers in every phase of health.

Over three thousand delegates and visitors, including physicians from England, Germany, Sweden, Mexico, Canada and the Canal Zone will be in Chicago to attend the meeting, which will open Monday evening, October 15, with a general session at which Dr. Herman N. Bundesen, president of the American Public Health Association, will deliver the opening address.

MEETING OF THE AMERICAN COLLEGE OF SURGEONS.

The American College of Surgeons will hold the eighteenth Clinical Congress in Boston, October 8-12. Headquarters will be at the Statler Hotel and meetings will be held in the ballroom of the Copley-Plaza Hotel and Symphony Hall. The Hospital Standardization Conference will be held in morning and afternoon sessions in the ballroom of the Copley-Plaza Hotel Monday, Tuesday, Wednesday and Thursday. An innovation this year will be the commencement of the clinics in the Boston hospitals on Monday afternoon, continuing through the mornings and afternoons of the following four days. Monday evening's pro-

gram will include an address of welcome by the local Chairman, the address o fthe retiring President, Dr. George David Stewart, New York, the inaugural address of the new president, Dr. Franklin H. Martin, Chicago, and the John B. Murphy oration on surgery by Professor Vittorio Putti of Bologna, Italy. Tuesday, Wednesday and Thursday evenings' sessions will be held in the ballroom of the Copley-Plaza Hotel. At the Wednesday evening meeting the visiting surgeons will be the guests of the Boston Surgical Society at a special meeting when the Bigelow medal is to be awarded. On Friday evening the Annual Convocation of the College will be held in Symphony Hall when the 1928 class of candidates for Fellowship in the College will be received. The fellowship address on this evening will be delivered by Dr. William J. Mayo.

A LETTER OF APPRECIATION

Thursday, Aug 30th, 1928.

To the Journal Committee and the Editorial Staff,
New Orleans Medical and Surgical Journal,
New Orleans, La.

My Dear Colleagues:

Arriving in the city yesterday after an absence of two months, I read for the first time the gracious editorial mention of my little talk at the Semi-centennial meeting of the Parish Medical Society which appears on page 68 of the July number of the Journal.

I would be less than human not to feel deeply gratified to think that I have earned that complimentary reference on the Editorial page, and I wish to thank the Staff collectively and the member individually who wrote those gracious words.

Ever since that memorable night I have been wondering what I could have said to please the audience so much, and I have about arrived at the conclusion that the incident is simply another remarkable instance of telepathy. The audience seemed to be with me in spirit, and it was no exaggeration on my part to say that looking into their earnest, friendly faces, my heart went out to them in fraternal affection.

I saw there the faces of my own personal associates, men with whom I have worked for years, along with the faces of the younger generation of doctors, many of whom I had known as students, or hospital internes, and realizing that I have, perhaps, but a few years yet to live, I appealed to them in the name of fraternal union, quoting the Psalmist's immortal words to inspire them with a realization of what those words, written centuries ago, mean to the medical profession of today, calling us to work together in harmony for our own sakes and for the success of the sacred cause to which we are pledged.

Again thanking you, I am

Yours most cordially,

G. FARRAR PATTON, M. D.

FOOTBALL NOTICE.

A courtesy is being extended by the Tulane Athletic Association to doctors attending the football games.

Telephone calls will be transmitted to them if they notify the ticket taker upon entering the stadium.

These calls may be answered at the press box.

OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETY OF NEW ORLEANS.

The New Orleans Ophthalmological and Otolaryngological Society held their scientific meeting on Thursday, June 21, 1928. Dr. C. U. Johnson presided as chairman of the meeting.

Dr. Brown presented a case of trachoma which progressively became worse. The patient states he has suffered from this disease for 25 years, that he was treated in the outdoor clinic of the Eye, Ear, Nose & Throat Hospital during 1904-5, in the Touro Clinics during 1907-8, that he has been a private patient of many local ophthalmologists.

On September 24, 1924, the patient presented, in both eyes, multiple ulcers of the cornea, marked pannus, the fornices were studied with trachoma follicles and the tarsus was thick and infiltrated bearing many scars; ptosis was obvious and there was some inflammation of the conjunctiva.

A smear and culture demonstrated the presence of pneumococci as a superimposed infection. The blepharospasm due to the intense photophobia and excessive lacrimation was responsible for the pitiable object the patient appeared when being led into the office for examination.

On September 14, 1924, a combined incision of the conjunctiva and tarsus, after the method of Kuhnt, as modified by Beard was performed.. Six weeks later the eye was quiet, all symptoms had subsided when the fellow eye was operated upon with the same technic. Six weeks following this operation the patient was entirely free from pain. The patient is a high hyperope and wears a plus 6 S. on a plus 1.50 C at axis 1.80 in his right

eye with a plus 4 S. in the left eye which brings his vision up to 20/40 minus 2. A lower addition of 2.50 S. affords J-2.

The patient has now resumed his duty as a baggage checker and is clinically cured of the trachoma This has continued over a period of four years following the operation.

Kuhnt has performed his operation 5,000 times and found the results of cured cases to be 50 to 60 per cent, while expression offered only 10 per cent.

Von Gernet in 1924 while assuming the argument against Peters reported 709 more operations for trachoma since his earlier publications, 402 of which were combined incisions.

Beard suggests the use of the Walker Lid Everter instead of the others in general use.

Dr. Ochsner presented a case of cerebrospinal rhinorrhea which he had previously presented before this society at the meeting previous to the last. The case not only presented the cerebrospinal fluid drainage into the nose but also a bilateral choked disc greater in the right eye with about 3 diopters with no mental derangements. On February, 1928, an osteoplastic flap on the left side was done. Many adhesions of the dura were found in the anterior fossa. No cerebral pathology was found. Following the decompression the patient improved. The papillio-edema diminished and the vision improved; the hearing also improved. The pathological findings were as follows: Wassermann, negative; Roentgen-ray, slight cloudiness of the left ethmoidal region particularly in the anterior group. The weakness of the lower limb on the left side which was recognized prior to the craniectomy became worse after the operation and finally resulted in a partial paralysis of the left side. Dr. Granger presented the Roentgen-ray plates in which he pointed out an erosion of the greater wings of the sphenoid more evident on the right side which is apparently the sight of rupture of the dura, which resulted in the cerebrospinal rhenoishoea. He also pointed out the fact that there was no erosion of the anterior clinoid processes nor was there any thinning of any parts of the skull indicative of increased intra-cranial pressure. Dr. Ochsner in closing the discussion brought out the fact that the severe headaches on the left side, the failing vision of the left eye and the diminished hearing of the left ear, and the rhinorrhoea of that side with the early onset and spontaneous occurrence suggested a lesion on the left side, hence the left craniectomy. In view of the fact that the left craniectomy failed to show any pathology and the existence of an increasing left hemiplegea, Dr. Ochsner recommended an exploratory craniectomy of the right anterior fossa.

Dr. Buffington presented a suspicious case of tumor of the cella turcica in a young man 17 years of age. The history was as follows: June 8, 1920, patient complained of headaches in occipital regions, dizziness especially on rising in the morning and when moving the head from side to side on the pillows at night. Nausea, vomiting and deafness of the left ear which progressed until it involved the right ear. His eyesight began to fail 6 months after the deafness. Vision 20/50 both eyes. Urine negative; Wassermann and spinal fluid negative, increased pressure. He gave a history of having had a bilateral spheno-ethmoidectomy several months prior to his visit to him. Examination of the eyes showed a bilateral choked disc of 3 diophters right eye and 4 diophters left eye. Fields showed a bitemporal hemianopsia. Examination of the Roentgen-ray plates showed evidences of an intra-cella tumor of the gland extending into the sphenoidal sinus although on examining the patient at the present time, one is able to see into the sphemoidal sinuses and evidence of a tumor is in vain. In the discussion the question of why the sphemoidectomy was done for no pathology was found, and why the diagnosis of an intracranial lesion was not made. One instantly sees why the diagnosis of a sphenoiditis was made prior to the diagnosis of an intracranial lesion because the symptomalogy simulated that of sphenoiditis which was as follows: dizziness, nausea, vomiting, occipital headaches, and optic memtis. The only symptom which was not indicative of sphenoiditis was the diminished hearing and on close examining the patient it was brought out that the patient not only had the four above mentioned symptoms but had post nasal dripping and occasionally a sore throat, which, with the above symptoms, were diagnostic of a sphenoiditis and undoubtedly the question of the sphenoidectomy was not a bad mistake. In closing his discussion of Dr. Ochsner's paper, Dr. Wagner answered the question as to why the diagnosis of an intracranial lesion had not been diagnosed by stating that because of the incipiency of the onset with so few symptoms other than the diminished hearing undoubtedly due to choked labyrinth in the ears negative on inspection, that there was no substantiality for the diagnosis, whereas today the patient with his diminished sight due to the choked disc and contracted fields of vision and relative bitemporal hemianspia, loss of hearing due to choked labyrinth, increased intracranial tumor most probably of the cella turcica, in view of the fact that there is increased intracranial pressure with choking of the disc which is rarely found in pituitary tumors, a cyst

of the pituitary pressing upward against the cavernous sinus interfering with the venous return from the optic nerve. If this case presented the symptoms and signs at the time the sphemoidectomy was done which he has at the present, it then shows the failure of a complete ear, nose and throat examination which I don't believe was true. A detailed history, examination of the throat, nose, nasopharynx and ears with a complete hearing and vestibular tests would have detected the choked labyrinth which in this case is of important differential diagnostic aid. Although the diagnosis of a choked labyrinth is not as easily made as a choked disc it is of more diagnostic value as far as intra-cranial lesions are concerned. The diagnosis of choked labyrinth is as follows: A patient whose hearing is gradually diminishing, either unilateral or bilateral, and usually bilateral, who on examination presents a normal external and middle ear on inspection and a patent eustachean tube on ausculation, with evidences of intracranial hypertension (increased cerebrospinal manometer reading, headache, projectile vomiting, Roentgen-ray findings) and a hearing test which shows an elevation of the lower tone limit, a lowering of the upper tone limit, and a diminished Schwabach test, with no evidences of otosclerosis confirmed by the absence of promentorial hyperemia, negative history of progressive deafness in the family and a negative Galle test. This patient not only showed evidences of choked labyrinth and choked disc but also an anosmia which went unrecognized. The Roentgen-ray examination as presented by Dr. Granger showed changes in the posterior clinoid processes suggestive of an erosion into the sphenoid and a tumor pressing backward from the cella turcica, also a double line forming the posterior wall of the sphenoid indicative of the tumor pressing into the sphenoidal sinus. In closing the discussion it was suggested that the tumor was one of cystic formation rather than adenomatous in character. The erosion of the posterior clinoid processes, the increased intracranial pressure evidently due to the cyst pressing against the foramen of Monroe, blocking the drainage of the cerebrospinal fluid of the ventricles, producing internal hydrocephalus resulting in the choked labyrinth, choked disc and other symptoms especially the anosima which is due to either pressure against the rhinencephalon by the tumor, or choking of the olfactory nerves, thus a diagnosis of a cyst of the cella turcica rather than an adenomatous tumor. In closing the discussion Dr. Ochsner proposed that a craniectomy of the anterior fossa be done to explore the anterior fossa as far inward as the cella. There was one occurrence in this case although unexplainable, the improvement in vision following the spheno-ethmoidectomy.

Dr. Dimitry presented a case of tabetic optic atrophy in which the disease destroyed one eye, resulting in a complete atrophy, and produced an active optic neuritis in the other in which the administration of arsenic in the midst of the activity produced a marked improvement of the inflamed eye which resulted in complete recovery of the neuritic eye. This case was presented to bring out the fact and to prove it, that arsenic and arsenical preparations such as sulpharsphenamin in active optic neuritis will bring about a cure rather than to aggravate the neuritis as some believe.

Dr. Dunn presented a retinoscope with an attachment to facilitate presbyopics in retinoscopy.

Dr. Granger showed several Roentgen-ray plates of a sphenoidal sinus which extended well down into the pterygoid processes of the sphenoid bone.

WILLIAM A. WAGNER, M. D.,
Secretary-Treasurer.

COMPARABLE RESULTS WITH THE WASSERMANN AND PRECIPITATION TESTS.—On account of delay in receiving the cut for this manuscript of Dr. H. W. Butler, publication of which was scheduled for the present number of the Journal, it was found necessary to withhold the appearance of the article until the next issue.

DR. BETHEA HONORED.—Dr. Oscar W. Bethea, chief of the department of medicine at the Baptist Hospital, and a member of the faculty of the medical school of Tulane University, has been elected to membership in the American Therapeutics Society. Dr. Bethea is the author of "Clinical Medicine", a book just off the press.

MISSISSIPPI STATE MEDICAL ASSOCIATION NEWS

J. S. Ullman, M. D., Associate Editor.

SPECIAL NOTICE.

To the Mississippi State Medical Association:

Gentlemen:

During the meeting of the Association in Meridian we caused to be distributed at the Registrar's desk pamphlets calling attention to the meeting of the Interstate Post Graduate Association in Atlanta, October 12-18, 1928. The completed program will be mailed out about September first, and we feel justified in saying that there has never before been given the physicians of this country such a splendid intensified post-graduate course as is here offered.

There is no charge for this service other than a five dollar registration fee. Over a hundred of the most famous medical teachers in the world will be on the program, which has been prepared by Dr. George Crile. This is the first time this meeting has been held in the South and it is an opportunity of a life time.

We feel sure that many members of the Mississippi Association will avail themselves of this rare treat.

(Signed),

W. H. FRIZELL, President

T. M. DYE, Secretary.

The De Soto County Medical Society held a public meeting in Hernando on September 14th. The following program was rendered:

The Necessity of a Yearly Physical Examination and Health Inventory—Dr. L. L. Minor.

The Southern Doctor—Hon. E. N. Wilroy.

An Address—Dr. Wm. B. Harrison, Supt. of the Shelby County Board of Health

The doctors were entertained by the P. T. A. whose officers are. President, Mrs. J. M. Wright; Chairman, Mrs. Joe Dean.

The staff meeting of the Vicksburg Sanitarium was held on September 10th with the following program:

1. Carcinoma of the Gall Bladder with Clinical, Operative, and Autopsy Findings—Dr. A. Street.

2. Unusual Hemorrhage following Adenoidectomy—Dr. G. M. Street.

3. Aneurism of the Digital Artery of Hand, with Operation—Dr. J. A. K. Birchett, Jr.

4. Calculus of the Bladder—Dr. J. K. A. Birchett, Jr.

5. Acute Anterior Poliomyelitis with Paralysis—Dr. L. J. Clark.

6. Extensive Cellulitis of the Arm; Streptococcus Infection—Dr. H. H. Johnston.

7. Some Notes on the Interpretation of Blood Findings—Dr. L. S. Lippincott.

The East Mississippi Medical Society met in Meridian on August 23, 1928.

The regular meeting of the Tri-County Medical Society was held in Brookhaven on September 11. The program was as follows:

1. Medical Sociology Excerpts—Dr. O. N. Arrington.

2. Acute Conditions within the Abdomen—Dr. D. T. Brock.

3. Roentgen-ray Study of the Chest—Dr. M. D. Ratcliff.

4. Calculi of the Gentro-Urinory Tract—Dr. O. B. Harvey.

Dr. J. H. Johnson of Brookhaven is slowly recovering from a long siege of illness. Dr. Johnson has been unable to attend his profesisonal duties the past few months. If he continues to improve during the next few weeks as he has the past month, he will be able soon to resume the greater part of his work.

The regular monthly meeting of the Issaquena-Sharkey-Warren Counties Medical Society was held in Vicksburg on September 11th. The program was as follows:

1. Am I My Brother's Keeper?—Dr. L. L. Martin, Anguilla.

2. A Paper—Dr. J. B. Benton, Valley Park.

3. Vincent's Infection of the Gums—Dr. G. W. F. Rembert, Jackson.

4. Some Notes on the Interpretation of Leucocyte Counts—Dr. L. S. Lippincott, Vicksburg.

The following are some abstracts from the August meeting:

Some Unique Country Surgery—Dr. W. H. Scudder.

George Washington, negro, 70 years of age, came home Saturday night drunk and abusive. His woman fired a load of buckshot into his arm at short range. His clothing was burned, the arm burned, and the contents of the gun with dirty clothing and paper wadding, passed into or through the upper arm, shattering the humerus. Patient seen next day. Several batered shot, much paper wadding, powder-burned rags and pieces of bone were removed; wound cleansed with carbolized water and dressed. Daily irrigations with iodin water were ordered. Other pieces of bone and debris were removed from day to day, until wound was free from pus. The two ends of the bone were then brought together and held in place with plaster of Paris bandages. Perfect union resulted with a three-inch shortening. Patient was soon plowing as usual. This occurred 30 years ago when we had just begun to talk of antiseptics.

A white female patient, about 45 years of age, had among other complaints, severe nasal catarrh, with the nasal cavity completely filled with polpi. From 150 pounds she had dropped to 110 in two or three years, and was confined to her bed most of the time. She became a morphin addict, using it hypodermatically with atropin. In less than a year she had gained 40 pounds, the catarrh was completely cured and the polypi gone; she was doing all her housework. After three years, she was then treated and cured of the opium habit. While this is not a surgical case, I felt that I could not miss the chance to tell you of my new remedy for catarrh.

Some Unoriginal Remarks on Mastoiditis—Dr. E. F. Howard.

Not all cases of mastoiditis are typical. Many show considerable resistance to infection and two-thirds of all get well without operation. With middle ear infection, there is always also some mastoid involvement, of the antrum at least. The laboratory should be consulted early to determine type of infection. A low grade infection requires less vigorous treatment than an infection with the streptococcus. Pneumococcus infection is one of the worst, with early widespread destruction of bone. Diphtheria occasionally causes otitis media. No case is thoroughly worked up without a Roentgen-ray examination to determine the anatomy and the extent of cell destruction. Mastoid symptoms may be duplicated by many other conditions. A number of interesting cases were presented.

Carcinoma of the Stomach—Dr. A. Street.

More than 30 per cent of all carcinoma occurs in the stomach. Carcinoma of the stomach is one of the most curable types, even coming for treatment as late as the average case does today. Five-year cures are obtained in about 35 per cent of the operable cases. But more than 50 per cent of the cases are plainly inoperative at the time of initial examination. If we are to improve the situation we must have a method of procedure which will give assurance that we are not treating palliatively a patient with early stomach growth. A persistent or recurrent digestive disorder of unknown cause, or any unaccounted for anemia or loss of weight in a person over 35 years, should be considered a possible case of cancer until careful examination, including Roentgen-ray, shows stomach free of evidence of growth. A number of Roentgen-ray studies of operable and inoperabel carcinoma of the stomach were presented.

The regular quarterly meeting of the Northeast Mississippi Thirteen Counties Medical Society was held in Tupelo on September 18th. The program was as follows:

1. Maxillary Sinusitis—Dr. D. H. Hamrick, Corinth.

2. Undulant Fever—Dr. J. F. Eckford, Starkville.

3. The Mechanism of Reduction of Simple Fractures—Dr. G. A. Caldwell, Shreveport.

4. Urinary Obstructions—Dr. L. B. Morris, Macon.

5. Abdominal Emergencies—Dr. W. H. Anderson, Booneville.

6. Nausea and Vomiting of Pregnancy—Dr. W. H. Eason, Tupelo.

At the September meeting of the Board of Supervisors of Adams County the establishment of a full time health unit was approved and the Board of Mayor and Alderman of Natchez have indicated their willingness to co-operate. In all likelihood Adams County will have a full time health unit in operation in the near future.

Lincoln, Copiah, Lafayette, Neshoba and Monroe Counties have made appropriation for the first time for this work and Lowndes county is showing very much interest. The following counties have the full time health units in operation

already: Bolivar, Clarke, Coahoma, Forrest, Hancock, Hinds, Holmes, Humphreys, Issaquena, Jackson, Jones, Lamar, Lauderdale, Lee, Leflore, Pearl River, Perry, Sharkey, Sunflower, Tishomingo, Union, Warren, Washington, and Yazoo.

RECENT VISITORS FROM OTHER STATES AND FOREIGN COUNTRIES.

The effective work of our State Board of Health has gained sufficient recognition outside of our borders to attract visitors to inspect its activities. Here is a list of visitors during the spring and summer:

Dr. L. W. Hackett, Rockefeller Foundation staff member, Rome, Italy; particularly interested in malaria control methods.

Dr. J. F. Kendrick, Rochester Foundation staff member, Madras, India; general observation of the program as a whole.

Mr. A. H. Balcarcel, sanitary engineer from Guatemala; malaria surveys and control measures.

Surgeon L. L. Lumsden, U. S. Public Health Service, Washington, D. C.

Dr. C. T. Teng, Canton, China, chief of the bureau of communicable diseases in Canton. He spent last year at Johns Hopkins School of Hygiene and Public Health and while at Indianola actually participated in all phases of the work.

Dr. I. J. Cruchley, who spent the past year at Johns Hopkins, will probably be director of a parochial health department upon his return to Jamaica. He was chiefly interested in the organization of the department, but spent several days on malaria work.

Dr. J. Nitzulescu, associate professor of medicine at the University of Jassay, Roumania, is making a study of pellagra in Sunflower County.

Dr. G. F. Telfer of California State Board of Health.

Engineer Samuel Saenz, Costa Rica, devoted his entire visit to the study of the malaria problem.

Engineer Mihai Grigoriu, assistant engineer for the ministry of Health, Roumania, spent most of his time with Mr. Parker acquiring experience in the sanitary engineering problems related to malaria.

H. N. Worth, sanitary engineer of Ceylon, and Mr. L. Continenino, sanitary engineer of Brazil, both interested in and acquiring experience in sanitary engineering problems related to malaria.

Dr. Charles N. Leach, Rockefeller Foundation, New York.

Dr. I. Gomoiu, who will be identified with rural public health work upon his return to Roumania, is spending his time at the Training Station studying the organization of a county health department and devoting some attention to the malaria problem.

Dr. Josip Vrtovec, Jugoslavia; mainly interested in the activities and organization of a county health department.

Dr. Miguel Bostamente, Mexico, is studying the organization of a county health program as well as doing laboratory and field work in connection with the antimalaria campaign.

Dr. J. H. Janney, Rockefeller Foundation, New York, who is to take charge of the Training Station at Indianola, Mississippi.

Dr. Selyven-Clarke, staff member of the Rockefeller Foundation, stationed in Africa.

Dr. A. G. Payne visited the Mayo Clinic during the month of September.

Dr. J. C. McNair has completed a four weeks course at the Sanatorium in Magee and has returned to his home in Fayette, Miss.

Dr. J. A. Price and his assistant, Dr. Overschmit, of Oakville Sanatorium, Shelby County, Tennessee, stopped over at the Sanatorium en route to Biloxi, where they attended the Southern Tuberculosis Conference.

Dr. and Mrs. Henry Boswell, Dr. and Mrs. Kemp, and Dr. May F. Jones attended the Southern Tuberculosis Conference in Biloxi. Dr. Jones was on the program for a report on the Health Camp work for children in the state, and also served on the Welcoming Committee.

The Southern Tuberculosis Conference and Southern Sanatorium Association met in Biloxi, September 12-15, 1928. There were group discussions on various subjects, such as: Seale Sale Institute, Tuberculosis Among Negroes, Tuberculosis in Childhood, and County Programs.

Dr. Henry Boswell presided at the evening session on September 12th, Dr. L. J. Moorman on the evening of the 13th and Dr. James A. Price on the evening of the 14th.

Dr. Felix J. Underwood welcomed the Association on behalf of the State Board of Health.

BOOK REVIEWS

Plastic Surgery of the Orbit: By J. E. Sheehan, M. D., F. A. C. S. New York, Macmillan. 1927. pp. 348. Illus.

Very few books tell you what you really want to know, and still fewer contain even a reasonable number of new ideas, or even old ideas differently expressed.

Dr. Sheehan has written the most complete and instructive volume on the "Plastic Surgery of the Orbit" that has ever been published in America. It represents the work of an experienced teacher and writer who thoroughly understands the subject and who tells you important interesting facts not usually found in other books.

Plastic surgery that will probably not materially reduce disfigurements should be left undone. Mutilating operations, especially about the face, should be performed only by those who are thoroughly familiar with the principles and practice of plastic surgery. Unfortunately much of our plastic surgery in the past has only substituted one type of disgusting deformity for another. The first operation should always be the first step towards cosmetic repair.

The chapter on physiology and anatomy of the skin is so interestingly written that it did not even make me drowsy. The author's simple and lucid description of the sympathetic nervous mechanism, based upon the work of Gaskell, is a pleasure and joy to read, as is the function of the capillaries with their independent contractility as first described by Krogh; and the physiology of the superficial lymphatics as studied by Le Calve.

The preparation, after care, and types of skin grafts are then discussed. The experiments of Tinker and Sutton apparently show that freshly prepared five per cent acriflavin in fifty percent alcohol and ten per cent acetone is at present our nearest practical approach to a skin antiseptic, and is apparently superior to tincture of iodin in plastic surgery.

The following paraphrases give one an excellent conception of the context in the next several chapters. Skin that is wrongly cut, cannot be righly sutured. The use of too much adrenalin from the so-called sterile bottle is a frequent cause of delayed healing. Cutting across the tension lines of the skin increases the visible scar. Scar must be entirely cut out of the picture. If a graft is to be placed anywhere before transference, it should be in the serum liberated at the place of excision. Bleeding is another enemy of perfect healing. The no-touch system is important in all plastic surgery procedures. Any suture that has to remain longer than four days ought not to have been used. There is always the tendency to overdo the employment of bandages.

The author prefers cat gut sutures to stop bleeding; chronic cat gut to relieve tension; silk worm gut for sub-cuticular stitches; horse hair as the skin suture material par excellence, and paraffin silk as second choice. Hygroscopic threads at different skin levels in the treatment of edema and the Ferris-Smith pressure bag in post-operative plastic treatments are interesting and important innovations.

The remainder of the book is devoted to a description of the various plastic procedures. Repair of an upper lid may be accomplished by a reversed Z incision or by a graft from the upper lid of the opposite side. The use of pedicle grafts from the chest, or forearm, to cover defect of the upper and lower lid hardly seem adapted to the average American patient.

Properly tatooed spots on the lid margins very closely resemble lashes in appearance. Actual replacement can be accomplished with the Kromeyer needle or a graft from the brow of the same side.

Loss of the lid margin is often best replaced by an angular or vertical notch, remembering that the anterior and posterior parts should not be sutured in the same line. Vertical lid injuries may often be greatly improved by free canthotomy and scar excision with liberating incisions. Island artery flaps with pedicle replacements of epithelium or mucous membrane; tarsal and facial muscle transplants; and epithelization of deformed sockets are best operated upon by those with broad experience and appropriate hospital facilitis.

In America, the Hess, Motais and Angelucci operations for ptosis are better known that that of de Blascovics. We opthalmologists, generally speaking, prefer extirpation of the lachrymal sac to the various nasal operations such as that of West or Toti. Dr. Sheehan being essentially a rhinologist, prefers the nasal route. That is no reflection on any of us.

The final chapters include a complete description of the various entropian and ectropian operations as well as the restoration of lid and tarsal defects. A discussion of local and general anesthesia as applied to the subject follows. A short chapter deals with the use of paraffin which the author believes should on no account whatever be introduced into the tissues of the human body.

An interesting preface by Professor Sibeleau of Paris, the author's preface, numerous artistic illustrations and a fairly complete index, add to the value of this very well written and constructive volume.

CHAS. A. BAHN, M. D.

Constitutional Inadequacies: An Introduction to the Study of Abnormal Constitutions: By Nicola Pende, M. D. Translated from the Italian by Sante Naccarati, M. D., Sc.D., Ph.D. Philadelphia, Lea & Febiger. 1928. pp. xv+270, 12 figures.

Pende, professor of clinical medicine in the Royal University of Genoa, a pupil and follower of Viola, presents in this work an epitome of the principles of constitution and their applications in individualized medicine.

About half of the book is devoted to general discussion and definitions of constitution, together with the formulae employed in differentiating constitutional types. Further, nine chapters deal with constitutional anomalies and inadequacies of separate systems. There is a chapter concerned with the principles of therapy of constitutional inadequacies, from which the following excerpts are quoted as representing a summary of the objective of the study of constitution.

"Hitherto the hygiene and prophylaxis to which we have turned our attention have been hygiene and prophylaxis of the community. Over against this social medicine, which seems to us to have but a very limited success in saving the individual, we place, as more indispensable, the prophylactic care of the individual, even while willing to make the latter work in unison with collective medicine and march side by side with it. Individual medicine, unlike collective hygiene, aims to apply to each individual, after a thorough preliminary study of his somatic and psychic personality, all the methods available to modern therapy, in order to strengthen the weak points of his bodily fabric and his psychic make-up. . . . We put up a struggle for the individual in order to secure for each one the greatest physical and psychic well-being within the limits assigned by the iron laws of heredity, which, as has been said, dominate the individual constitution. . . . In order to strengthen organisms that are affected by constitutional weakness, we must have recourse to the great directing principles of stimulative training of the miopragic organs, functional re-education and rational gymnastics of the organic apparatus, with a view to carrying their small range of functional excursion to the farthest limits possible. . . . In this training of organs we must never lose sight of the unitary principle of constitution, that it is impossible to act upon one organ or apparatus without taking account of the condition of other parts of the body that are in intimate anatomical and functional correlation with that organ. . . . Another great principle of individual prophylaxis and of the treatment of organic miopragia which we must adopt when training is not possible or produces no noticeable results in that of functional economy. This principle consists in not imposing greater labor on an organ than it can perform, but in seeking, on the contrary, ever to augment its reserve of energy by relative repose, and thus to prevent habits of ill-regulated living out of proportion to the capacity of the functional effort of the organs, from ever dragging these organs into a condition of pathological decomposition. . . . A third principle which has the same aim of avoiding the premature wearing out and exhaustion of the already poor nutritive and functional reserve of a constitutionally weak organ is that of protecting it from all those abnormal stimuli—toxic, physical and psychic—that may electively damage the organ itself. . . . Finally, we can, up to a certain point, undertake to correct constitutional anomalies by means of organotherapy, and especially by seeking to act upon the system which is the regulator, par excellence, of the trophic and functional equilibrium of the organism—the endocrine system. . . . Lastly, eugenics and prenatal care of the child will seek to limit as much as possible the harmful influences exercised by constitutional anomalies of parents upon the constitution of their offspring. . . . Individual prophylaxis, or the reclaiming of constitutions that are weak in body and mind, will enter upon its phase of definite practical realization the day it becomes possible for every individual at any period of his life to have a complete somatic and psychic constitutional formula recorded from time to time in a suitable individual book of health."

HAROLD CUMMINS, PH.D.

Practical Clinical Psychiatry for Students and Practitioners: By Edward A. Strecker, A. M., M. D., and Franklin G. Ebaugh, A. B., M. D. Second edition, enlarged and revised, with illustrations. Philadelphia, P. Blakiston's Sons & Co. 1928. pp. 458.

This, the second edition of this volume shows a marked completeness over the first edition. It is written in a understanding vein, the composition of the subject matter therein has been brought down to date.

The authors are well trained in neuropsychiatry, having had much contact with their specialty, and the neuropsychiatric atmosphere of institutions known for progressive and scientific medicine. I may say that this volume can be classed as one of the newer psychiatry so necessary in our present stage of medical education where, in a number of medical colleges, so little time is spent in the teaching of this particular branch of medicine becoming necessary for the physician following his graduation to occupy some of his time in reading a volume of this type as an aid in contacting his general practice.

The chapters are well written, especially the paragraphs in chapter four under "Organic Psychosis" which deals with the malaria treatment of neuro-syphilis. In this you find the very latest research data of the authors on this very interesting subject. The case history method of teaching as used by the Massachusetts General and McLean Hospitals of Boston are noted. This should make the subject much easier for those interested.

The nomenclature used throughout likewise shows the progressiveness in psychiatric fields of the authors. It is to be hoped that general hospitals will see fit to include in their nomenclature this series of diagnoses for in many institutions there are still in use antiquated nomenclatures dating back many years.

The paragraph of dedication to the late C. Lincoln Furbush is a tribute to one whose energies and efforts while in office was instrumental in elevating the standards of mental hygiene in his community.

The foreword by Burr, of the University of Pennsylvania, is as only a master can write. The neuropathology of Winkelman, a pupil of Spiller, is covered thoroughly and intelligently.

This volume crystallizes the efforts of two competent men extensively trained in neuropsychiatric problems.

W. J. Otis, M. D.

International Clinics: 38th Series, V. 2, 1928. Philadelphia, J. B. Lippincott Co. 1928. pp. 344.

This issue of International Clinics marks the 15th volume. There are several very interesting reminiscenses in the book. The policies of the clinics are outlined. Several important medico-dental subjects are dealt with at great length. As a whole the issue lives up to the usual high quality of the work.

I. L. Robbins, M. D.

Gonococcal Urethritis in the Male: By P. S. Pelouze, M. D. Illustrated. Philadelphia, W. B. Saunders Co. 1928. pp. 357.

The mission of this work is plainly set forth by the author in his preface. He has endeavored in his book to "correlate and arrange knowledge of the disease (gonorrhea) so that it can be easily understood; to unravel the endless skein of pseudo-science that has been spun about it." This he does in a most lucid fashion. Commonsense marks practically every page of the monograph. His years of teaching urology in the University of Pennsylvania give his opinions weight that deserve serious consideration from the physician interested in the subject. This book should be in every hospital library where the internes and the younger staff members could refresh their memory relative to the important phases of gonococcal therapy. In the introductory chapter he attacks the "moral turpitude" of the public today and its bearing on the "social disease." The lay reader can obtain information from this chapter of as much value to himself as can the average physician.

The peculiarities of the Neisser diplococcus, the pathology of the malady, susceptibility and immunity, and the defensive processes against the infection are explained in a brief yet clear and convincing way.

It is only proper that a treatise such as this should devote the proper space to treatment. Pelouze devotes nearly a hundred pages to management of urethritis and its complications in the male.

In discussing the oral administration of drugs for the disease he fails to mention pyridium, which is unquestionably of much value especially in the acute stage. Under local treatment to the urethra with antiseptic solutions he compares the syringe method with the irrigation treatment and attempts to explain that the irrigation method fails because of the "foolish, bungling way in which it has been used." This will hardly be accepted by the majority of younger workers in the field. The syringe method unquestionably is superior. His views in regard to vaccine in gonorrhea are also far from being in accordance with modern thought. However, none of these points detract from the value of the book. Pelouze gives his personal opinions and experience throughout—to the exclusion of the opinions of others—and this is sufficiently commendable to recommend it.

The latter third of the book—Part II—is devoted to the clinical case-records exemplifying instances of every conceivable phase of gonococcal invasion in the male, and is alone well worth the price of the book. Teaching disease by illustration with case-records has now established itself on a firm footing. From these many examples quoted by Pelouze, the clinician can profit much.

On the title page appears the legend "for practitioners." We are glad to note that the prosaic "for general practitioners" has been dispensed with. This is truly a timely contribution to the subject for all practitioners and deserves a wide circulation and cordial reception.

H. W. E. Walther, M. D.

International Clinics, Vol. III: Philadelphia, J. B. Lippincott Co. September, 1927. pp. 311.

The section devoted to diagnosis and treatment contains numerous articles, all ably written and containing a wealth of valuable data. Of these articles, "The Clinical Aspect of Thrombo-Anglitis Obliterans," by Dr. Steel, furnishes a fairly complete differential diagnosis of the allied diseases, augmented by beautiful illustrations in color. "Differential Diagnosis and Treatment of Gall-Bladder Disease," by Dr. Held and Dr. Gray, and "The Electrocardiographic Study of the Various Forms of Heart Block," by Dr. Wilson, are articles, each in its individual field, worthy of much merit.

In medicine, Drs. Goldstein and Goldstein give a thorough review of the recent literature on "Pneumococcus Meningitis and Endocarditis," together with interesting and complete case reports.

Dr. Masland writes an instructive article on "Deformity Correcting Splints for Fractures of the Long Bones," in the section on Surgery. In Obstetrics, Dr. Longaker and Dr. Harrimon ably discuss the advantages and disadvantages of the Kielland forceps.

The sections on neurology, medical history and post-graduate study are each supplied with one or more articles by able contributors.

The wide range of interests represented in each of the articles and their splendid portrayal combine to make the volume most delightful and instructive reading.

MORELL W. MILLER, M. D.

Modern Methods of Treatment: By Logan Clendenning, M. D. With chapters on special subjects by H. C. Anderson, M. D., J. B. Cowherd, M. D., H. P. Kuhn, M. D., Carl O. Rickter, M. G., F. C. Neff, M. D., E. H. Skinner, M. D., and E. R. DeWeese, M. D. 2d Ed. St. Louis, C. V. Mosby Co. 1928. pp. 815.

Dr. Clendenning's book can be unreservedly recommended as one of the most useful to the medical student and practitioner. As I turned its pages my respect grew for the manner in which the author has carried out his purpose. I was particularly struck by three qualities; first, it is most readable—a quality which so many text books on therapeutics lack; second, it is stimulating, particularly because of the plan of giving something of the historical background and particularly because of the quoting of pioneer workers in each field. This is supplemented by a short list of references at the end of each chapter. These references are being chosen with the ideas in view that they should be easily available and authoritative. The third quality of the book is, of course, the most essential, namely, that it is reliable. The methods chosen for elaboration and recommendation are those which have been put to the test of time and experience, have a sound scientific basis, and represent modern up-to-date practice.

I. L. LEMANN, M. D.

Introduction to Objective Psychopathology: By G. V. Hamilton, M. D. St. Louis, C. V. Mosby Co. 1925. pp. 354.

A novel and somewhat daring presentation of the subject most interestingly arranged and presented. The author's interpretation and translation of Freudian concepts on the basis of his own experience and clinical studies are quite refreshing.

F. L. FENNO, M. D.

Cardiac Arrythmias: By Irving R. Roth, M. D. New York, Paul B. Hoeber, Inc. 1928. pp. 210.

This volume on heart arrythmias can be highly recommended to the student and general practitioner The mechanism of the arrythmias is very clearly brought out by graphs and original diagrams. Teachers of cardiology will find the graphs of value for demonstration purposes as the author has incorporated in them not only the cardiac mechanism involved but also the heart sounds, arterial and venous pulses. The aim of this volume, in contrast to more extensive works, is to offer the elements of graphic studies in the arrythmias and to emphasize their clinical features. The first part of the book is a review of the anatomical and physiological facts essential to the understanding of the mechanism of the normal heart beat. The second part deals exclusively with the arrythmias. The book is simply and clearly written and well illustrated.

RANDOLPH LYONS, M. D.

International Clinics, 38th Series, March, 1928, Vol. 1: Philadelphia, Lippincott Co. 1928. pp. 307.

The reviewer did not find many articles of general interest. The chapter on medical progress of 1927, however, was quite complete and gave much information. Another article which deserves special mention is that describing an ingenious splint for hand fractures. The following subjects may prove of interest: Sanochysin, tularemia, autogenous cerebral abscess, electric mouth gag in tonsillectomy.

NARCISSE THIBERGE, M. D.

Hay Fever and Asthma: By Balyeat, A. M., M. D. Philadelphia, F. A. Davis Co. 1928. pp. 310.

It was my privilege to review this book when the previous edition appeared; from a compend it has grown to a full-fledged book, well illustrated and clearly edited. Much stress is put in this edition on the improved method of exact study of the various pollens and the area where several pollens are found is studied. Surveys, maps and colored plates are given and will be found of invaluable help to the student.

Among the new chapters added are the following: Atmospheric influences, focal infections as a cause, skin allergy, all about kapok and ephedrin, and most interesting of all, the chapter on orris root.

All those interested in allergy should certainly read the book.

NARCISSE THIBERGE, M. D.

Textbook of Bacteriology: By William W. Ford, M. D. Philadelphia, W. B. Saunders & Co. 1927. pp. 1069.

After carefully reviewing the Text Book of Bacteriology prepared by Dr. William W. Ford, I have found it to be one of the most complete editions ever published on this subject.

I do not believe that any library is complete without this book.

ANDREW O. FRIEDRICHS, M. D.

PUBLICATIONS RECEIVED.

Lea & Febiger, Philadelphia: A Text-Book of Fractures and Dislocations, by Kellogg Speed, S. B., M. D., F. A. C. S. Bronchial Asthma, by Harry L. Alexander, A. B., M. D.

P. Blakiston's Sons & Co., Philadelphia: Recent Advances in Diseases of Children, by Wilfred J. Pearson, D. S. O., M. C., D. M., F. R. C. P., and W. G. Wylie, M. D., M. R. C. P. Recent Advances in Surgery, by W. Heneage Ogilvie, M. A., M. D., M. Ch., Oxon., F. R. C. S., Eng.

F. A. Davis Company, Philadelphia: Practical Surgery of the Abdomen, Volumes I and II, by George H. Juilly, M. D. Diseases of the Ear, Nose and Throat, Medical and Surgical, by Wendell Christopher Phillips, M. D. Sugical Diagnosis in Tabular Outline for Students and Physicians, by Dr. J. A. Cemach, Vienna, Austria; authorized translation, with additions and notes, by Edward L. Bortz, M. D. The New Pocket Medical Formulary with an Appendix, by William Edward Fitch, M. D.

J. B. Lippincott Company, Philadelphia and London: International Clinics, by leading members of the Medical Profession throughout the world, edited by Henry W. Cattell, A. M., M. D., Philadelphia.

William Wood & Company, New York: A Practical Medical Dictionary, by Thomas Lathrop Stedman, A. M., M. D.

The Williams & Wilkins Company, Baltimore: A Laboratory Manual of Physiological Chemistry, by D. Wright Wilson.